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TIME-DEPENDENT STRUCTURE OF THE UPPER ATMOSPHERE

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SUMMARY

The physical properties of the upper atmosphere are determined principally by heat conduction, heat sources, and the barometric law. An analysis of the integro-differential equation describing these physical processes has been carried out. It is found that heating of the thermosphere due to absorption of the solar extreme ultraviolet (EUV) radiation alone cannot explain the observed diurnal variation of density and temperature, since it would yield a maximum of these properties at about 17^h local time, instead of 14^h where it is observed. Secondly, if the EUV flux is adjusted to give the observed average temperature, then the amplitude of the diurnal density variation would be much too large compared to the observed amplitude. Thirdly, it would require an extremely high efficiency for the conversion of EUV radiation into heat (i.e., comparing the required flux with Hinteregger's measurements of the EUV flux). Thus, it is necessary to have another heat source in addition to the absorption of EUV radiation. If an additional heat source is used, with a maximum at about 9^h local time and a flux of 1 erg/cm^2-sec, a time-dependent model of the upper atmosphere is obtained that is in good agreement with the observed densities. There is evidence that this additional heat source derives its energy ultimately from the solar corpuscular radiation.

The results of calculations are presented for a model in the equatorial and temperate zones of the earth for those times when the average solar activity corresponds to a solar radiation flux of 200×10^{-22} W/m^2-cps at 10.7 cm wavelength. The physical properties (temperature, density, pressure, scale height, mean molecular weight, and the number densities of N_2, O_2, O, He and H) are given as a function of local time and for the altitudes between 120 and 2050 km.

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INTRODUCTION

The energy balance of the upper atmosphere is determined principally by absorption of solar energy and heat transfer by conduction. These processes are described by the time-dependent equation for heat conduction and by the heat source functions. If these equations are combined with the equation for hydrostatic balance they yield the physical properties of the upper atmosphere as functions of time and altitude.

The solutions of these equations have been studied in detail by a process of numerical integration, and the results have been compared with time-dependent models derived from satellite density data, to obtain some information on the nature of upper atmosphere heat sources.

During the past three years, four main types of phenomena have been found to affect the physical properties of the upper atmosphere; this information was obtained mostly from analysis of the fluctuations in the orbital periods of artificial satellites. Any theoretical model of the upper atmosphere should be able to account for the following phenomena:

the solar activity effect,
the diurnal variation,
the geomagnetic activity effect, and
the semiannual variations.

The *solar activity effect* is defined as the correlation found between density fluctuations in the altitude range from 200 to 1600 km and the solar flux in the decimeter (3 to 30 cm) wavelength range (References 1-9). This correlation has again been confirmed by Jacchia and Slowey (Reference 10) in their analysis of the orbit of the 12-foot balloon satellite (1961 delta 1).

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The solar decimeter radiation cannot be the physical cause of the fluctuations but is merely an index of it. This radiation in the wavelength range from 3 to 30 cm is the so-called "slowly varying component" produced, according to Waldmeier and Müller (Reference 11), by thermal emission from condensations in the solar corona. This flux is proportional to $A\int n_e n_i \, ds$, integrated along the ray path through the condensation, where n_e and n_i represent the number densities of electrons and ions respectively and A the projected area of the condensation.

The solar activity effect in the upper atmosphere is believed to be caused to a large extent by the heating due to absorption (photoionization) of solar extreme ultraviolet (EUV) radiation. Hinteregger (Reference 12) has shown from rocket observations that the absorption of this radiation occurs in the altitude range between 150 and 300 km.

The main process producing the emission lines in the extreme ultraviolet is likely to be the emission due to cascades following recombination on excited levels. Consequently, the total intensities of these lines can also be expected to be proportional to the aforementioned integral, if self-absorption is negligible. A close correlation can reasonably be expected between the decimeter flux and the strongest lines in the extreme ultraviolet range of the solar spectrum – He II at 304 Å, He I at 584 A, and numerous lines of highly ionized atoms – since these lines should also originate mostly in the coronal condensations.

The proportionality factor between density and the decimeter flux is observed to be a function of height and local time and is larger during the nighttime. This behavior is to be expected from the diurnal variation of the temperature in the atmosphere (References 13 and 14).

The *diurnal density variation* has an amplitude which increases with altitude. At 210 km it is only a few percent of the mean value according to the orbital analysis (Reference 15) of the Sputnik III rocket and satellite (1958 δ_1 and δ_2). At an altitude of 650 km, however, the amplitude reaches a factor of almost ten, as found by Priester and Martin (Reference 5), Jacchia (Reference 16), Paetzold and Zschörner (Reference 17), King-Hele and Walker (Reference 18). The data showing this effect were obtained mostly from Vanguard I and II (1958 β_2 and 1959 α_1). These data also revealed that in the diurnal variation the density reaches its peak at approximately 14^h local time, then declines, and at about sunrise the density again begins to increase rapidly to its peak value. This behavior results from the combined action of a time-dependent heat source and thermal conduction. This was pointed out by Nicolet (Reference 19).

The *geomagnetic activity effect* in the upper air densities was noted by Jacchia (Reference 19) as a correlation between the short-lived density fluctuations and the geomagnetic activity represented by the K_p or A_p indices. This effect was confirmed by density data obtained from seven satellites during the "November 1960 events" (References 20

and 21). It was also confirmed by Jastrow and Bryant (Reference 9) who used the data from Echo I, and was further verified by Paetzold (Reference 22) who used the data from Sputnik II (1958 δ_2). The closest correlation of this kind has been obtained with data from the twelve-foot balloon satellite Explorer IX (1961 δ_1) by Jacchia and Slowey (Reference 10).

This effect strongly suggests the existence of another heat source in addition to the absorption of solar EUV radiation. It seems plausible to attribute this additional heat source to energy that is ultimately derived from the solar corpuscular radiation or from its "steady" component, the solar wind.

The existence of such an additional heat source also is suggested by the fourth effect, a *semiannual variation* in atmospheric density found by Paetzold and Zschörner (Reference 17) with maxima in March and September and minima in June and July and also in December and January. This behavior is quite similar to the semiannual variation of geomagnetic activity found by Cortie (Reference 23) and discussed in great detail by Bartels (Reference 24).

Paetzold and Zschörner (Reference 25) estimate that a decrease of 0.2 erg/cm^2-sec in the overall flux used for heating during the minima (June-July and December-January) is required to explain the observed decrease in density. This suggests that the second heat source, which we shall call a "corpuscular" heat source, normally provides an energy flux that is a few times larger than the aforementioned value of 0.2 erg/cm^2-sec. A crude estimate may also be obtained from the absolute value and the variation of the geomagnetic u-measure defined by Bartels (Reference 24) as the *"inter-diurnal variability of the horizontal component at the geomagnetic equator."* In a recent paper by Priester and Cattani (Reference 26) the semiannual variation of the u-measure was related to a model of the solar corpuscular radiation dependent on heliographic latitude.

In view of this relationship and with roughly 20 percent semiannual variation in the amplitude of the u-measure, we might expect a corpuscular heat source with a total flux in the order of 1 erg/cm^2-sec. The measurements from Explorer X by Bridge et al. (Reference 27) revealed a flux of about 5 ergs/cm^2-sec for the solar wind outside the earth's magnetosphere; thus the present estimate of 1 erg/cm^2-sec for the "corpuscular" heat source seems plausible. Since this heat source is likely to have a diurnal variation, the estimated flux given refers to the diurnal peak value.

These conclusions are supported by the results obtained from the calculations presented herein of the energy balance of the upper atmosphere, in which the time-dependent heat conduction equation was used with the condition of quasi hydrostatic equilibrium. These results showed that a theoretical explanation of the observed atmospheric densities can be obtained only by considering a second heat source which contributes approximately the same amount of heat to the upper atmosphere as the EUV heat source.

In this solution, which represents the observed densities, a peak flux of 0.93 erg/cm^2-sec was used for the fraction of the solar EUV radiation converted into heat and a peak flux of 1.03 erg/cm^2-sec for the corpuscular heat source.

HEAT CONDUCTION EQUATION FOR A GAS IN EQUILIBRIUM WITH A GRAVITATIONAL FIELD

The temperature distribution of the upper atmosphere is governed mainly by thermal conduction and absorption of solar energy (see Spitzer, Reference 28, and Nicolet, Reference 29). As the temperature undergoes a diurnal variation, the upper atmosphere expands and contracts. This expansion and contraction produces a transfer of heat by mass flow. In the motion of the thermosphere energy is expended or gained as a result of the work done by or against gravity. In this section we shall give a heuristic derivation of the appropriate equation, which will contain an expansion-contraction term allowing for the heat transfer due to the diurnal "breathing" of the thermosphere and the work done by or against gravity.

We shall use Eckart's Equation 9-6 (Reference 30) for the temperature dependence of a gas undergoing a flow in an external gravity field. By simplifying this equation to one dimension and expressing it in different notation, we have

$$\frac{\partial T_1}{\partial t} + \frac{\partial T_0}{\partial z} w + \frac{\gamma - 1}{a_0} \frac{\partial w}{\partial z} = \frac{q}{C_v} \quad . \tag{1}$$

This is one of the linearized equations of hydrodynamics in which:

T_1 = the perturbed temperature,
w = the vertical velocity of the gas,
T_0 = the initial temperature distribution at any initial time,
C_v = the specific heat at constant volume,
γ = the ratio of the specific heats,
a_0 = the coefficient of thermal expansion, which is $1/T_0$ for an ideal gas, and
q = the net gain of heat (in erg/gm-sec) due to heat sources and conduction (will be given in detail subsequently).

The derivation will be given for a gas with a single constituent, but we shall generalize later to include a multiconstituent thermosphere.

The vertical velocity of a gas w will be obtained in a form based upon the considerations used by ionospheric physicists in studying the drift motions of the $F2_{max}$ level of the ionosphere (see Ratcliffe and Weeks, Reference 31). As the atmosphere expands and contracts, we shall assume that a cell of gas reaches an altitude $z + w\Delta t$, at a time $t + \Delta t$,

where the pressure is the same as at the altitude z at the previous time t, i.e., $p(z + w\Delta t,\ t + \Delta t) = p(z,\ t)$. Since this motion is very slow (on the order of 10 km/h at 500 km) we shall also assume that the pressure, to the first order, follows the barometric law. Thus

$$p_0 \exp\left[-\int_0^{z+w\Delta t} \frac{gM}{RT(t+\Delta t)}\,dz'\right] = p_0 \exp\left[-\int_0^{z} \frac{gM}{RT(t)}\,dz'\right] ,$$

where g is the acceleration due to gravity, R the universal gas constant, and p_0 is the pressure at the earth's surface which for our purposes is constant. We expand the above in powers of Δt according to

$$\frac{1}{T(t+\Delta t)} = \frac{1}{T(t)}\left(1 - \frac{1}{T(t)}\frac{\partial T}{\partial t}\Delta t\right)$$

and obtain

$$w = T\int_0^z \frac{1}{T^2}\frac{\partial T}{\partial t}\,dz' \tag{2}$$

or, in the spirit of the linearized Equation 1

$$w = T_0\int_0^z \frac{1}{T_0^2}\frac{\partial T}{\partial t}\,dz' .$$

By differentiating the latter with respect to z, we have

$$\frac{\partial w}{\partial z} = \frac{\partial T_0}{\partial z}\int_0^z \frac{1}{T_0^2}\frac{\partial T}{\partial t}\,dz' - \frac{1}{T_0}\frac{\partial T}{\partial t} ,$$

which we substitute into Equation 1:

$$\frac{\partial T_1}{\partial t} + \gamma\frac{\partial T_0}{\partial t}T_0\int_0^z \frac{1}{T_0^2}\frac{\partial T_1}{\partial t}\,dz' + (\gamma - 1)\frac{\partial T_1}{\partial t} = \frac{q}{C_v}$$

or

$$\frac{\partial T_1}{\partial t} + \frac{\partial T_0}{\partial z}T_0\int_0^z \frac{1}{T_0^2}\frac{\partial T_1}{\partial t}\,dz' = \frac{q}{C_p} , \tag{3}$$

where C_p is the specific heat at constant pressure.

Equation 3 is our basic equation; we shall integrate it numerically, taking for T_0, $\partial T_0/\partial z$, and the non-linear terms in q, their values at $t - \Delta t$, where Δt is our integration interval. In this fashion new initial solutions are determined which will be used as the unperturbed functions T_0 in each step of the integration process. Thus the numerically determined perturbed solutions will not differ greatly from the unperturbed solutions at any time. With this understanding for the treatment of the non-linear terms, we drop the subscripts 1 and 0.

The second term on the left side of Equation 3, being proportional to the gradient of the temperature, represents a mode of "convective" transport of heat owing to the diurnal expansion and contraction — a free expansion of a non-isothermal gas in a gravitational field. In its present form this term also partially includes the effects of gravity. The main effect of gravity in the heat balance is contained in the right side of Equation 3 where C_p appears instead of C_v.

It remains to be shown that the assumptions leading to the expression for w are consistent with Eckart's Equation 9-5 for the variation of the perturbed pressure, which in the present one-dimensional notation is

$$\frac{\partial p_1}{\partial t} + \frac{\partial p_0}{\partial z} w + \rho_0 \gamma \frac{RT_0}{M} \frac{\partial w}{\partial z} = (\gamma - 1)\rho_0 q , \tag{4}$$

p_0 being the unperturbed pressure and ρ_0 the unperturbed density.

From hydrostatic equilibrium, we have $dp_0/dz = -\rho_0 g$ and substituting in Equation 4 the expression for w we obtain

$$\frac{\partial p_1}{\partial t} = \rho_0 g T \int_0^z \frac{1}{T_0^2} \frac{\partial T}{\partial t} dz' ;$$

or from the perfect gas law $p = \rho RT/M$,

$$\frac{\partial \rho_1}{\partial t} = -\frac{\rho_0}{T} \frac{\partial T_1}{\partial t} + \frac{g\rho_0 M}{R} \int_0^z \frac{1}{T^2} \frac{\partial T}{\partial t} dz' . \tag{5}$$

From the conservation of mass,

$$\frac{\partial}{\partial t} \int_0^\infty \rho \, dz = \int_0^\infty \frac{\partial \rho}{\partial t} dz = 0 . \tag{6a}$$

Thus by integrating Equation 5 over z, we obtain

$$\int_0^\infty \frac{\rho_0}{T}\frac{\partial T}{\partial t}\,dz = \int_0^\infty dz\,\frac{g\rho_0 M}{R}\int_0^z dz'\,\frac{1}{T^2(z')}\,\frac{\partial T(z')}{\partial t} \quad . \tag{6b}$$

The double integral on the right side of this equation can be transformed in the following manner: it is an integral over an area in the $(z,\ z')$ plane bounded by the z-axis and the $z = z'$ line; and the order of the integration can be changed by first integrating with respect to z from $z = z'$ to $z = \infty$, and then over z' from 0 to $z' = \infty$. Thus Equation 6b becomes

$$\int_0^\infty \frac{\rho_0}{T}\frac{\partial T_1}{\partial t}\,dz = \int_0^\infty \frac{1}{T_0^2(z')}\,\frac{\partial T(z')}{\partial t}\left[\int_{z'}^\infty \frac{gM}{R}\rho_0(z)\,dz \quad dz'\right] dz' \quad .$$

If the foregoing is to be true for all possible variations of $\partial T/\partial t$, we must have

$$\rho_0 = \frac{1}{T_0}\int_z^\infty \frac{gM}{R}\rho_0(z')\,dz'$$

which is another form of the barometric law for the case of a non-isothermal atmosphere. By differentiating the above with respect to z to obtain

$$\frac{\partial \rho_0}{\partial z} = -\frac{1}{T}\frac{gM}{R}\rho_0 - \frac{1}{T_0^2}\frac{\partial T_0}{\partial z}\int_z^\infty \frac{gM}{R}\rho(z')\,dz'$$

and by using Equation 6a, we have

$$\frac{\partial \rho_0}{\partial z} = -\frac{1}{T_0}\frac{gM}{R}\rho_0 - \frac{\rho_0}{T_0}\frac{\partial T_0}{\partial z} \quad .$$

Integrating, we have

$$\frac{\rho_0}{\rho_{00}} = \frac{T_{00}}{T_0}\exp\left[-\int_0^z \frac{gM}{RT_0}\,dz'\right] \quad , \tag{7}$$

where ρ_{00}, T_{00} are the values of ρ_0 and T_0, respectively, at $z = 0$.

Thus, we see that the assumption of hydrostatic equilibrium (in the approximation of the linearized equations) for deriving w is consistent with the equation for the variation of

pressure with time. We can integrate the time-dependent equation (Equation 3), assuming that Equation 7 holds at any instant of time.

In order to generalize the above expression for a multi-constituent thermosphere, we shall now give the expression for q:

$$q\rho = Q_{cond} + Q_{euv} + Q_{ox} + Q' .$$

The term

$$Q_{cond} = \frac{\partial}{\partial z}\left(K(T)\frac{\partial T}{\partial z}\right) \tag{8}$$

is the net gain of heat by conduction, where

$$K(T) = \frac{\sum_i A_i n_i(z)}{\sum_i n_i(z)} T^{1/2}(z) \tag{9}$$

is the coefficient of heat conduction, A_i is a constant depending upon the constituent i, and n_i is the number density of atoms or molecules of the i^{th} constituent. From Chapman and Cowling (Reference 32) (1960) (see also Nicolet, (Reference 29)) we have the following values (in erg/cm-sec-$^\circ K^{3/2}$):

$$\begin{aligned} A(H) &= 2.1 \times 10^3; \\ A(He) &= 9.0 \times 10^2; \\ A(0) &= 3.6 \times 10^2; \\ A(0_2, N_2) &= 1.8 \times 10^2. \end{aligned}$$

The heat source due to the absorption of the solar EUV-radiation is given by

$$Q_{euv} = \sum_i \epsilon_i n_i(z) \int_0^\infty d\lambda\, F_\lambda \sigma_i(\lambda) e^{-\tau_i(\lambda, z, t)} , \tag{10}$$

where

$$\tau_i(\lambda, z, t) = \int_z^\infty \sigma_i(\lambda) \frac{n_i(z)}{\cos\theta}\, dz \quad ;$$

$\sigma_i(\lambda)$ is the cross-section for absorption by the i^{th} constituent of radiation of wavelength λ in the region $d\lambda$; F_λ is the incident flux of wavelength λ in the region $d\lambda$ at the top of the

atmosphere; and θ is the zenith angle of the sun, ϵ_i is an efficiency factor for the conversion to thermospheric heat of energy in the extreme ultraviolet absorbed by the i^{th} constituent.

The heat loss due to the cooling by atomic oxygen radiating in the infrared is given by (Reference 33)

$$Q_{ox} = -n_0 f(T) ,$$

where

$$f(T) = E_1 A_{12} \left(\frac{W_1 \exp\left(-\frac{E_1}{kT}\right)}{W_2 + W_1 \exp\left(-\frac{E_1}{kT}\right) + W_0 \exp\left(-\frac{E_0}{kT}\right)} \right) ;$$

n_0 is the number density of atomic oxygen; E_1 the energy difference between the $3P_1$ and $3P_2$ levels of atomic oxygen; E_0 the energy difference between the $3P_0$ and $3P_2$ levels of atomic oxygen; W_0, W_1, W_2 the statistical weights of the various levels; and A_{12} the Einstein coefficient for the transition $3P_1$-$3P_2$.

The observations of the geomagnetic activity effect and of the semiannual effect strongly indicate the existence of another heat source, the energy of which is very likely provided ultimately by the solar corpuscular radiation and/or its "steady" component, the solar wind, for which we reserve a quantity Q' in our basic formula. Detailed considerations about this source are given later.

We need the expression for the total heat capacity at constant pressure, which we take as

$$\rho C_p = \sum_i n_i(z) k B_i ,$$

where k is the Boltzmann constant and B_i is a constant depending upon the constituent:

$$B_i \begin{cases} = & 3.5 \text{ for diatomic molecules;} \\ = & 2.5 \text{ for monatomic molecules.} \end{cases}$$

Equation 3 may be rewritten as

$$\frac{\partial}{\partial z}\left(K(T)\frac{\partial T}{\partial z}\right) - \rho C_p \frac{\partial T}{\partial z} T \int_{z_0}^{z} \frac{1}{T^2}\frac{\partial T}{\partial z} dz' + Q_{euv} + Q_{ox} + Q' = \rho C_p \frac{\partial T}{\partial t} \qquad (11)$$

which we shall integrate numerically. This equation is linearized by evaluating the nonlinear factors from the temperature and density values at the previous time step in the integration procedure. All quantities in Equation 11 depend on altitude z and time t. After the temperature profile is determined, the number densities n_i are calculated by means of the barometric relation

$$n_i(z,t) = n_i(z_0)\frac{T(z_0)}{T(z,t)} \exp\left[-\int_{z_0}^{z} \frac{m_i g(z')}{kT(z',t)}\, dz'\right] . \tag{12}$$

The numerical procedure used to integrate Equation 11 was the implicit method (see Diaz et al., Reference 34) for solving parabolic equations. This method avoids the problem of instability which can arise from application of the explicit method (see Lowan, Reference 35). The boundary conditions are a given initial temperature distribution, the temperature and densities of the constituents at the lower boundary held constant in time, and a zero gradient of the temperature at the upper boundary. The numerical integration was performed on an IBM 7090 computer.

Various integration intervals in time and space were tested, $\Delta t = 0.25$ hours and $\Delta z = 1$ km were found to be satisfactory. The temperature gradient was zero at the upper boundary, which was taken to be 1000 km. An upper boundary at this altitude assures that the gradient in the temperature goes smoothly to zero. Several initial temperature profiles were used to discover how rapidly the results converge to a final steady temperature profile of diurnal variation. This procedure necessitated integrating over a period of four or five days in real time to achieve convergence, regardless of the initial temperature profile used.

A small quantity equal to 10^{-3} added to $\cos\theta$ to avoid the divergence when $\cos\theta$ goes to zero corresponds to an error of 2/3 minute in time.

During the computations it was found that the "convective" term corresponding to heat transport caused by the diurnal variation of the temperature is small. It decreases the mean diurnal temperature of the exosphere by less than 5 percent.

The total pressure was computed by summing up the partial pressures due to each constituent, which were calculated from the perfect gas law

$$p_i(z,t) = n_i(z,t)\,kT(z,t) . \tag{13}$$

The total density was calculated by means of

$$\rho(z,t) = \sum_i n_i(z,t)\, m_i , \tag{14}$$

where m_i is the mass in grams of the i^{th} type of molecule. Then the mean molecular weight was calculated from

$$M(z,t) = \frac{\sum_i n_i(z,t)M_i}{\sum_i n_i(z,t)} \quad . \tag{15}$$

Finally, the scale height was computed by using

$$H(z,t) = \frac{RT(z,t)}{M(z,t)\,g(z)} \quad . \tag{16}$$

The densities at heights greater than 1,000 km were computed by the following method. In the isothermal region

$$n_i(z,t) = n_i(z_m,t) \exp\left[-\frac{m_i}{kT_m(t)}\int_{z_m}^{z} g(z')\,dz'\right] \quad , \tag{17}$$

where T_m is the temperature in the isothermal region which begins at the altitude z_m, which was taken equal to the upper boundary of the integration (1,000 km). By integrating Equation 17 we have for the number densities at heights above z_m,

$$n_i(z,t) = n_i(z_m,t) \exp\left[-\frac{m_i g_m R_m}{kT_m(t)} \frac{z - z_m}{R_m - z_m + z}\right] \tag{18}$$

where the acceleration of gravity is

$$g(z) = g_m\left(\frac{R_m}{R_m - z_m + z}\right)^2 \quad , \tag{19}$$

g_m being the acceleration of gravity at the distance R_m from the center of the earth, at height z_m.

INTERPRETATION OF RESULTS

In the attempts to obtain a theoretical time-dependent model of the upper atmosphere by solving the heat conduction equation for the atmosphere in quasi hydrostatic equilibrium (Equations 11 through 16) – a model which should represent the observed densities satisfactorily, the absorption of solar EUV radiation combined with the heat loss Q_{ox} due to

infrared reradiation by oxygen atoms was the only heat source used at first. The loss due to reradiation has only a small influence on the temperature distribution, as has been previously noted by Hunt and Van Zandt (Reference 36). (The source Q' in Equation 11 was taken as zero in these first attempts.) The calculations yield a diurnal maximum temperature and density at 17^h local time, not at 14^h as observed from satellite drag data. The losses due to conduction and Q_{ox} are not sufficient to balance the heat input due to Q_{euv} and thereby yield a maximum temperature at 14^h. Furthermore, the ratio of daytime maximum temperature or density to nighttime minimum temperature or density respectively is much larger than the observed ratio: the calculations employing the EUV absorption as the only heat source yield a temperature ratio of 2.6, while the observed value is about 1.5.

These results are qualitatively independent of boundary conditions. For testing, two different sets of number densities were used which differed considerably in the important ratio O/O_2 at the lower boundary. Diffusive equilibrium was assumed to hold for all altitudes above 120 km. The numerical values for the boundary conditions at 120 km are given in Table 1. A temperature of 355°K was chosen in both cases; no attempt was made to account for a diurnal variation of this temperature, since no considerable variation was expected at this altitude. However, further investigation is desirable.

Table 1
Boundary Values at 120 km Altitude
(T = 355°K)

Constituent	Number Density (particles/cm³)	
	Set 1*	Set 2**
N_2	5.80×10^{11}	5.95×10^{11}
O_2	1.20×10^{11}	3.13×10^{10}
O	7.60×10^{10}	2.57×10^{11}
He	2.50×10^{7}	2.50×10^{7}*
H	4.36×10^{4}**	4.36×10^{4}

*Values are from Nicolet (Reference 37)

**Values are from Jastrow and Kyle (Reference 38)

Mean values for the photoionization cross sections were used: 15, 15, and 12×10^{-18} cm^2 for N_2, O_2, and O respectively. These averages are valid for the wavelength range from about 60 to 900 A.

The incident flux was chosen to yield a model which is in agreement with the average observed densities and temperatures, specifically around 600 km. As an illustration, consider the maximum and minimum values of temperature and density at 600 km calculated for two different fluxes of the EUV radiation: In the first example the flux was 1.8 erg/cm^2-sec and the first set of boundary values (Table 1) was used. A maximum temperature of 1959°K was obtained at 17^h local time, and a minimum of 849°K at 6^h. The corresponding densities are 1.59×10^{-15} and 3.44×10^{-17} gm/cm^3. In the second example the flux was 2.2 erg/cm^2-sec and the second set of boundary values was used. The maximum and minimum temperatures and densities obtained at 600 km are 2026°K at 17^h local time, 910°K at 6^h, and 3.81×10^{-15} and 1.47×10^{-16} gm/cm^3 respectively.

The peak fluxes are generally considerably higher than the flux of 1.1 erg/cm²-sec required by D. C. Hunt and T. E. van Zandt (1961), who compared the observed data at diurnal maximum with a time-*in*dependent solution. This discrepancy occurs because the time-independent solution can be applied only to define diurnal average values if the time-independent flux is considered as a diurnal average. A comparison with the observed diurnal maximum values therefore yields unacceptable conclusions.

The diurnal variation of the temperature calculated with only the EUV heat source is given in Figure 1 for an altitude of 600 km (dashed line), along with the temperature distribution (solid line) which well represents the observed data.

It is concluded that no agreement can be obtained between the observations and a theory based on a EUV heat source alone. Furthermore, an extremely high efficiency (70 to 90 percent) would be required for the conversion of the EUV flux into thermospheric heat if this theory is to compare with Hinteregger's rocket measurements — a total flux of 2.5 erg/cm²-sec in the range from 44 to 1,000 A (Reference 12).

Therefore the existence of a second heat source with the following properties is strongly suggested: a maximum in the mid-morning and a minimum in the early or mid-afternoon, a small amount of heating during the night, and an average magnitude comparable to the heat provided by the EUV flux.

A heat source with these properties is required to represent the density observed at those times when a large diurnal bulge is found. For the comparison the Bonn Observatory model of 1961 (Reference 39) was used; it is in very good agreement with the density data obtained by other groups. This model is reduced to years of high solar activity, represented by a 10.7 cm solar radiation flux of $S = 200 \times 10^{-22}$ w/m²-cps or by the corresponding flux $S = 170 \times 10^{-22}$ w/m²-cps of the 20 cm solar radiation.

The time variation of this new heat source which we have called the "corpuscular" heat source, might be correlated with some other geomagnetic phenomena which would serve as indicators of corpuscular activity. The intensities of the micropulsations observed by

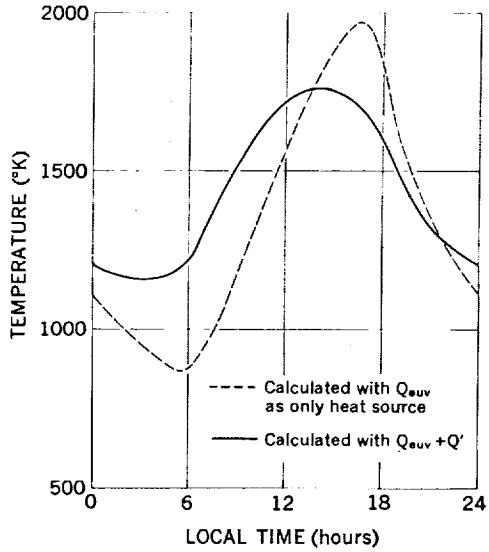

Figure 1—Diurnal variation of the exospheric temperature calculated with an EUV heat source alone (Q_{euv}) and combined with the additional "corpuscular" heat source ($Q_{euv} + Q'$).

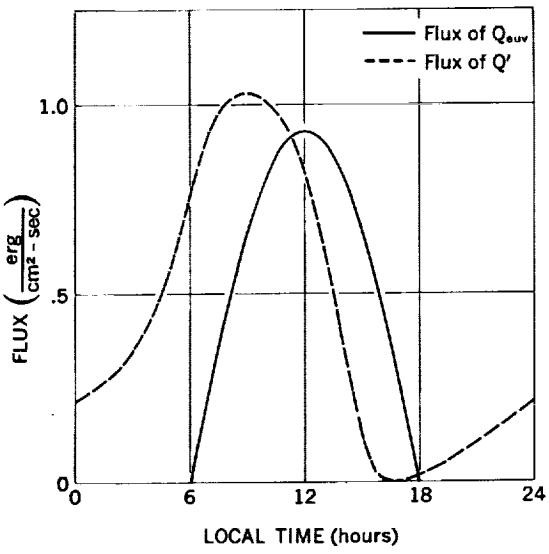

Figure 2—Diurnal variation of the fluxes of the EUV heat source (Q_{euv}) and of the "corpuscular" heat source (Q')

Campbell (Reference 40) in California show the main maximum at about 9^h local time, and thereby have the principal property required. A physical connection of these pulsations with the second heat source proposed here is plausible, but direct observations of micropulsations in the ionospheric F-layer would be desirable. The geomagnetic field strength at the equator also has approximately the time-varying properties required.

The chosen diurnal variation of the flux of the corpuscular heat source which is given in Figure 2, together with the fraction of the solar EUV flux converted into heat in the thermosphere (having a peak value of 0.93 erg/cm²-sec). This implies an efficiency factor of 37 percent. The peak value of the flux of the corpuscular heat source that yields a good agreement with the observed densities is 1.03 erg/cm²-sec. This value is in good agreement with the estimates obtained from the semiannual variation (see the Introduction). It also agrees with the magnitude of the heat source proposed by Dessler (Reference 41) — a source which is due to the dissipation of hydromagnetic waves generated by the solar corpuscular radiation. The energy dissipation takes place in the F region of the ionosphere. For the altitude dependence of our corpuscular head source Q' an analytic approximation to the dissipation curve given by Dessler is used. This altitude dependence is also similar in shape to the heat input due to absorption of solar EUV radiation.

The expression used for Q' is

$$Q' = \frac{F}{s_1 - s_2}\left[\exp\left(-\frac{z - z_0}{s_1}\right) - \exp\left(-\frac{z - z_0}{s_2}\right)\right] f(t) \quad ,$$

where

$$F = \int_{z_0}^{\infty} Q'(z, t_{max})\, dz$$

is the flux of this heat source at the time of its peak value. The values chosen for s_1, s_2, and z_0 are 60, 40, and 120 km respectively which yield a maximum for Q' at 170 km. The diurnal variation f(t) is normalized to a peak value equal to unity and is represented by the following Fourier coefficients:

$a_0 = +0.427$, $a_1 = -0.263$, $a_2 = +0.063$,
$a_3 = -0.015$, $a_4 = +0.024$, $a_5 = -0.006$,
$a_6 = -0.004$,

$b_1 = +0.369$, $b_2 = -0.156$, $b_3 = +0.010$,
$b_4 = +0.208$, $b_5 = -0.007$.

By using this corpuscular source in addition to the EUV heat source good agreement is obtained between observed and calculated densities. The better general agreement is obtained with the first set of boundary conditions in Table 1. The solid line in Figure 1 shows the calculated diurnal variation of the exospheric temperature. In Figures 3 and 4 the calculated diurnal variations of densities are compared with the densities of the Bonn Observatory model (Reference 39). In the altitude range from 400 to 700 km, where the Bonn model is based on the most reliable density determinations, we have an almost perfect agreement. For altitudes below 400 km the agreement is also satisfactory. In the range above an altitude of 1,000 km the Bonn Observatory model is based on densities derived from the satellite Echo I by Römer (References 6 and 7) using a method which

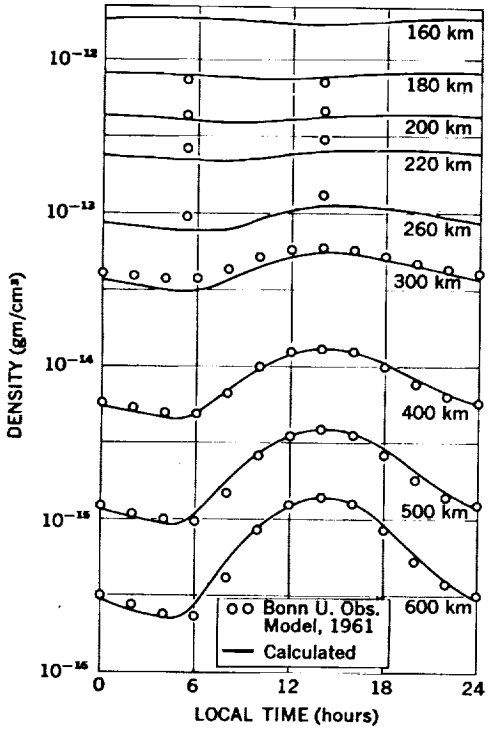

Figure 3—Diurnal variation of density for selected altitudes from 160 to 600 km. The solid curves give the values calculated with Table 1. The circles are densities taken from the Bonn University Observatory observational model of 1961.

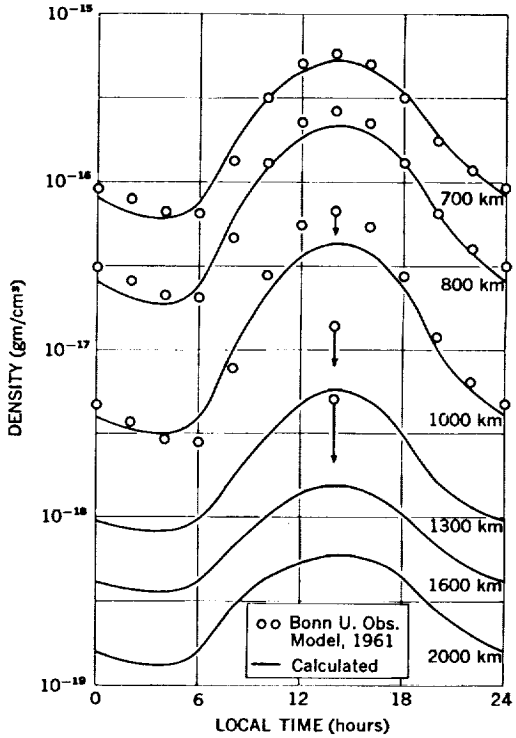

Figure 4—Diurnal variation of density for selected altitudes from 700 to 2,000 km. The solid curves give the values calculated with Table 1. The circles are densities taken from the Bonn University Observatory observational model of 1961.

takes into account the diurnal bulge by considering how the orbit traverses the bulge. An auxiliary model was needed for his calculations. The one he used early in 1961 was based on an extrapolation of the altitude variation of the diurnal amplitude; this variation increased systematically with height. In an atmosphere containing a helium layer (where the mean molecular weight decreases with altitude and time) the amplitude of the diurnal density variations begins to decrease again above 1,000 km (Figure 4). Therefore, the maximum densities in the Bonn model are too great for altitudes above 1,000 km by an estimated amount indicated by the arrows in Figure 4. Those reduced densities are then in better agreement with our calculated densities. The densities calculated by Bryant (Reference 9) using a general density scale height of 260 km are all placed well between our maximum and minimum density curves in the altitude range from 1075 to 1450 km.

The temperature, scale height and mean molecular weight are given as functions of altitude for four selected local times of the day in Figures 5, 6 and 7 respectively. It may be noticed that the 10^h and the 22^h temperature curves in Figure 5 cross at about 170 km. This is related to the fact that the daytime densities in the altitude range from 130 to 190 km are lower than the nighttime densities, in agreement with the observational model by Martin et al. (Reference 39). The mass difference between the nighttime and daytime densities below 190 km is sufficient to provide the mass for the diurnal bulge above that height, since our model conserves the total mass (see Equation 6).

In Figure 8 the densities of the observational model at an altitude of 600 km are compared with the densities calculated for both sets of boundary conditions which differ considerably in the ratio O/O_2 at the lower boundary (120 km). In general, both sets

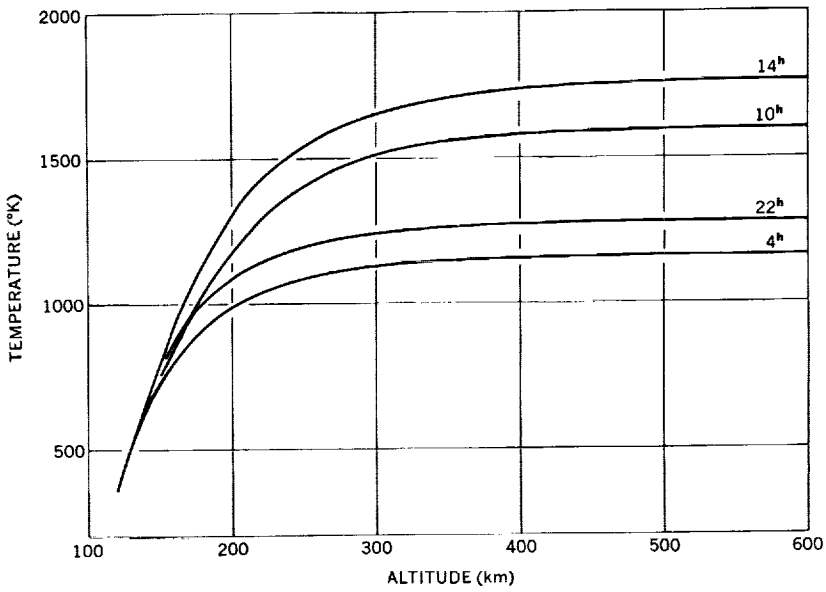

Figure 5—Temperature as a function of altitude from 120 km to 600 km for four selected local times.

afford a satisfactory agreement in the range from 200 to 600 km; the first set yields a better fit with the observed data at 600 km (Figure 8), but the discrepancy is not large enough to eliminate the second set. The observed densities may need some systematic corrections, since the atmospheric bulge was only approximately considered in the reduction of the observational data (Reference 39).

It is interesting to compare the exospheric maximum and minimum temperatures for these two sets of calculations. From the first set of boundary conditions the results are 1770°K for the diurnal maximum and 1160°K for the diurnal minimum. The corresponding temperatures for the second set are 1515° and 975°K respectively. These values demonstrate the sensitivity of the exospheric temperature to the boundary conditions and, especially, to the ratio O/O_2. In the first set this ratio is 0.63; in the second set, 8.2.

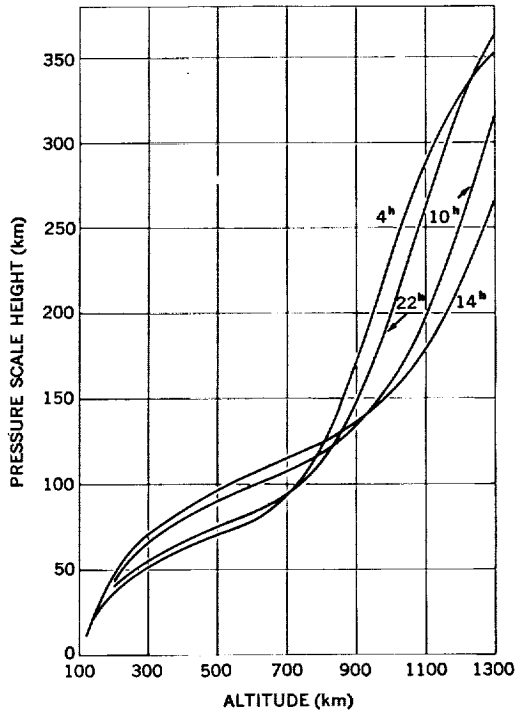

Figure 6—Pressure scale heights as a function of altitude from 120 km to 1,300 km for four selected local times.

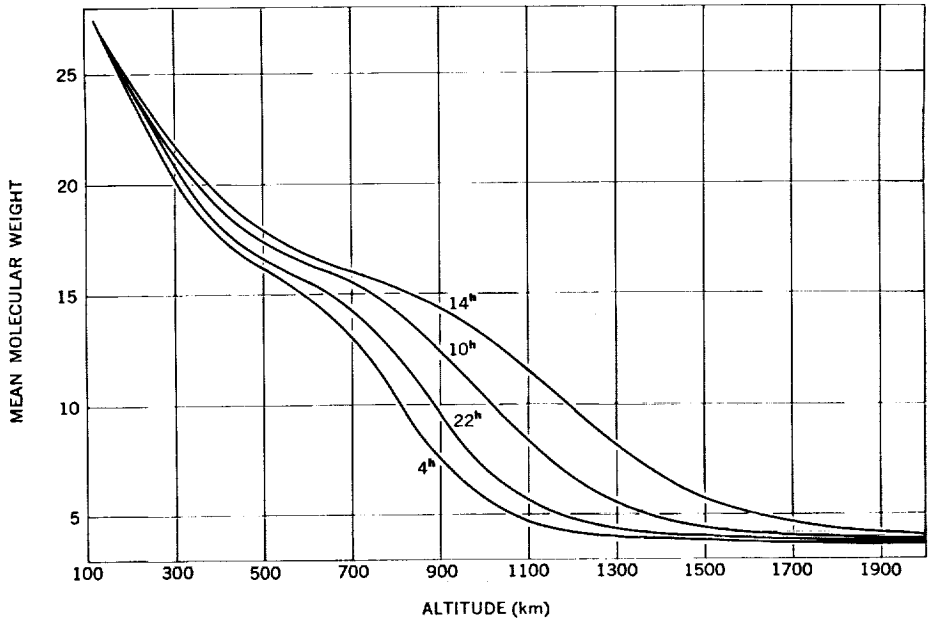

Figure 7—The mean molecular weight as a function of altitude from 120 km to 1,300 km for four selected local times.

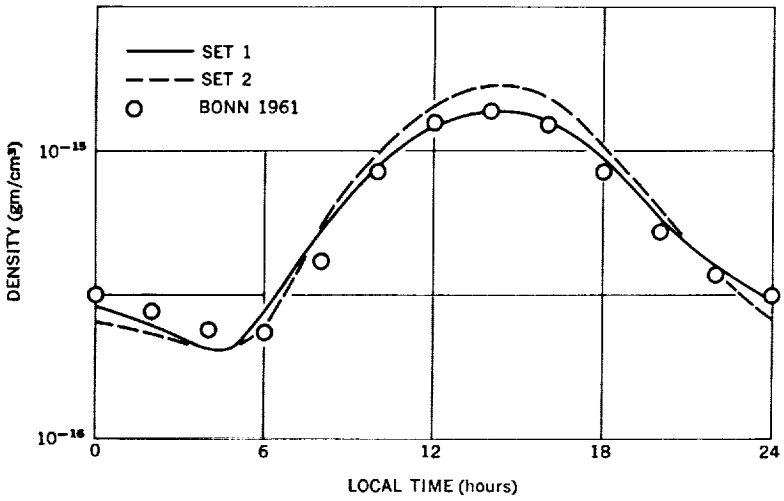

Figure 8—Comparison of the calculated densities using the two sets of boundary conditions given in Table 1 with the observed data of the Bonn 1961 Model at an altitude of 600 km.

The physical properties of the upper atmosphere based on the first set of boundary conditions (Table 1) are presented in Appendix A as functions of altitude from 120 to 2,050 km for selected hours in local time. This model applies to the equatorial and temperate zones of the earth and is valid for those years when the solar activity can be represented by an average flux of 200×10^{-22} w/m²-cps for the 10.7 cm radiation (or a flux of 170×10^{-22} w/m²-cps for the 20 cm radiation).

It should be emphasized again that to obtain good agreement with the observational model a heat source in addition to the solar EUV flux is required. It is probable that this heat source derives its energy ultimately from the solar corpuscular radiation.

In the present calculations good agreement was obtained with the observational models with a diurnal average flux of 0.44 erg/cm²-sec and a peak value of 1.03 erg/cm²-sec at 9^h local time, combined with an EUV heat source having an average flux of 0.30 erg/cm²-sec and a peak value of 0.93 at 12^h local time.

Of the four effects mentioned in the introduction, this calculated model is for the diurnal variation alone. The three other effects could be represented by changes in the total fluxes of the two heat sources, both of which are expected to vary considerably during the 11-year solar cycle. The analysis of the density determinations from satellite drag measurements during an entire solar cycle could reveal the necessary information about the flux variations of the two heat sources. But we should also be prepared for the possibility that the diurnal variation of the corpuscular heat source may change in shape and in position of the maximum during the colar cycle. Therefore, direct measurements of the solar EUV radiation and of the solar wind intensity outside the magnetosphere are urgently desired for at least one solar cycle.

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Appendix A

Properties of the Upper Atmosphere as Functions of Local Time

The properties of the upper atmosphere are tabulated as a function of local time (for every hour of the day) and as a function of altitude (from 120 km to 2050 km). The quantities listed are: temperature (°K); density (gm/cm^3); pressure ($dynes/cm^2$); scale height (km); mean molecular weight, and number densities (cm^{-3}) for N_2, O_2, O, He, H. At the beginning of each page the local time (in hours); the cosine of the zenith angle θ of the sun during the times of equinoxes on the equator; and the temperature gradient at 120 km in °K/km (labeled INT GRAD) are given.

The model used applies to the earth's equatorial and temperate zones when the average solar activity is represented by a solar radiation flux of 200×10^{-22} w/m^2-cps at a wavelength of 10.7 cm.

TIME (IN HOURS)= -0. , COS(TH)= 10.0000E-01, INT GRAD= 1.7313E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	514	1.174E-11	1.860E-02	16.8	26.98	1.919E 11	3.576E 10	3.445E 10	1.553E 07	2.929E 04
140	646	5.457E-12	1.103E-02	21.5	26.56	8.846E 10	1.526E 10	2.007E 10	1.143E 07	2.288E 04
150	752	3.017E-12	7.209E-03	25.5	26.16	4.833E 10	7.818E 09	1.330E 10	9.199E 06	1.932E 04
160	837	1.849E-12	4.994E-03	28.9	25.78	2.922E 10	4.468E 09	9.527E 09	7.806E 06	1.711E 04
170	905	1.213E-12	3.594E-03	31.9	25.40	1.885E 10	2.739E 09	7.171E 09	6.855E 06	1.562E 04
180	960	8.334E-13	2.658E-03	34.4	25.02	1.272E 10	1.762E 09	5.583E 09	6.162E 06	1.456E 04
190	1003	5.924E-13	2.006E-03	36.6	24.64	8.852E 09	1.172E 09	4.453E 09	5.631E 06	1.377E 04
200	1039	4.319E-13	1.538E-03	38.6	24.26	6.307E 09	8.000E 08	3.614E 09	5.207E 06	1.315E 04
220	1090	2.428E-13	9.370E-04	42.1	23.49	3.361E 09	3.925E 08	2.469E 09	4.563E 06	1.227E 04
240	1125	1.440E-13	5.926E-04	45.2	22.73	1.870E 09	2.018E 08	1.742E 09	4.084E 06	1.166E 04
260	1148	8.881E-14	3.858E-04	48.0	21.98	1.069E 09	1.070E 08	1.255E 09	3.704E 06	1.121E 04
280	1164	5.645E-14	2.571E-04	50.6	21.25	6.234E 08	5.786E 07	9.160E 08	3.387E 06	1.085E 04
300	1175	3.679E-14	1.749E-04	53.1	20.56	3.683E 08	3.177E 07	6.751E 08	3.115E 06	1.055E 04
320	1183	2.451E-14	1.210E-04	55.6	19.91	2.198E 08	1.763E 07	5.011E 08	2.876E 06	1.029E 04
340	1189	1.663E-14	8.507E-05	57.9	19.32	1.322E 08	9.875E 06	3.739E 08	2.663E 06	1.005E 04
360	1193	1.148E-14	6.060E-05	60.1	18.79	8.002E 07	5.568E 06	2.801E 08	2.470E 06	9.842E 03
380	1195	8.050E-15	4.368E-05	62.1	18.32	4.869E 07	3.159E 06	2.106E 08	2.295E 06	9.646E 03
400	1198	5.718E-15	3.182E-05	64.1	17.90	2.976E 07	1.801E 06	1.588E 08	2.135E 06	9.460E 03
420	1199	4.111E-15	2.339E-05	65.9	17.52	1.827E 07	1.032E 06	1.201E 08	1.988E 06	9.283E 03
440	1201	2.987E-15	1.734E-05	67.7	17.19	1.125E 07	5.934E 05	9.096E 07	1.853E 06	9.114E 03
460	1201	2.190E-15	1.295E-05	69.3	16.90	6.958E 06	3.427E 05	6.906E 07	1.728E 06	8.951E 03
480	1202	1.620E-15	9.735E-06	70.9	16.63	4.316E 06	1.987E 05	5.254E 07	1.613E 06	8.794E 03
500	1203	1.206E-15	7.364E-06	72.4	16.38	2.686E 06	1.156E 05	4.004E 07	1.506E 06	8.641E 03
520	1203	9.043E-16	5.602E-06	73.9	16.15	1.677E 06	6.749E 04	3.058E 07	1.407E 06	8.492E 03
540	1204	6.818E-16	4.286E-06	75.4	15.92	1.050E 06	3.954E 04	2.339E 07	1.315E 06	8.348E 03
560	1204	5.167E-16	3.297E-06	77.0	15.69	6.590E 05	2.324E 04	1.792E 07	1.229E 06	8.207E 03
580	1205	3.935E-16	2.549E-06	78.7	15.46	4.150E 05	1.370E 04	1.375E 07	1.150E 06	8.069E 03
600	1205	3.010E-16	1.983E-06	80.4	15.21	2.620E 05	8.107E 03	1.057E 07	1.076E 06	7.935E 03
620	1205	2.312E-16	1.551E-06	82.4	14.94	1.659E 05	4.811E 03	8.137E 06	1.008E 06	7.805E 03
640	1205	1.783E-16	1.220E-06	84.5	14.64	1.053E 05	2.864E 03	6.274E 06	9.440E 05	7.677E 03
660	1206	1.380E-16	9.660E-07	86.9	14.32	6.706E 04	1.710E 03	4.846E 06	8.846E 05	7.552E 03
680	1206	1.073E-16	7.701E-07	89.7	13.97	4.281E 04	1.024E 03	3.748E 06	8.292E 05	7.430E 03
700	1206	8.374E-17	6.184E-07	92.8	13.58	2.739E 04	6.152E 02	2.903E 06	7.776E 05	7.311E 03
720	1206	6.563E-17	5.005E-07	96.3	13.15	1.758E 04	3.707E 02	2.252E 06	7.295E 05	7.195E 03

740	1206	5.167E-17	4.083E-07	100.4	12.69	1.131E 04	2.240E 02	1.750E 06	6.847E 05	7.081E 03
760	1206	4.087E-17	3.360E-07	105.1	12.20	7.292E 03	1.357E 02	1.361E 06	6.428E 05	6.969E 03
780	1206	3.249E-17	2.791E-07	110.4	11.68	4.715E 03	8.248E 01	1.061E 06	6.037E 05	6.861E 03
800	1206	2.596E-17	2.339E-07	116.4	11.13	3.056E 03	5.027E 01	8.277E 05	5.672E 05	6.754E 03
820	1207	2.087E-17	1.979E-07	123.2	10.58	1.985E 03	3.072E 01	6.468E 05	5.331E 05	6.650E 03
840	1207	1.688E-17	1.690E-07	130.8	10.02	1.293E 03	1.883E 01	5.061E 05	5.012E 05	6.548E 03
860	1207	1.375E-17	1.458E-07	139.3	9.46	8.443E 02	1.157E 01	3.965E 05	4.714E 05	6.448E 03
880	1207	1.128E-17	1.268E-07	148.6	8.92	5.525E 02	7.130E 00	3.111E 05	4.436E 05	6.350E 03
900	1207	9.319E-18	1.113E-07	158.7	8.40	3.624E 02	4.406E 00	2.445E 05	4.175E 05	6.255E 03
920	1207	7.763E-18	9.856E-08	169.6	7.90	2.383E 02	2.729E 00	1.923E 05	3.931E 05	6.161E 03
940	1207	6.521E-18	8.793E-08	181.1	7.44	1.571E 02	1.695E 00	1.515E 05	3.702E 05	6.069E 03
960	1207	5.524E-18	7.901E-08	193.1	7.02	1.037E 02	1.056E 00	1.195E 05	3.488E 05	5.979E 03
980	1207	4.720E-18	7.146E-08	205.6	6.63	6.868E 01	6.593E-01	9.439E 04	3.287E 05	5.892E 03
1000	1207	4.068E-18	6.502E-08	218.2	6.28	4.557E 01	4.127E-01	7.465E 04	3.099E 05	5.805E 03
1050	1207	2.910E-18	5.250E-08	249.6	5.56	1.650E 01	1.294E-01	4.175E 04	2.678E 05	5.597E 03
1100	1207	2.185E-18	4.345E-08	278.9	5.05	6.058E 00	4.120E-02	2.353E 04	2.319E 05	5.399E 03
1150	1207	1.708E-18	3.661E-08	304.5	4.68	2.254E 00	1.332E-02	1.337E 04	2.012E 05	5.211E 03
1200	1207	1.380E-18	3.124E-08	326.0	4.43	8.493E-01	4.371E-03	7.649E 03	1.749E 05	5.032E 03
1250	1207	1.143E-18	2.691E-08	343.6	4.26	3.242E-01	1.455E-03	4.409E 03	1.523E 05	4.861E 03
1300	1207	9.634E-19	2.334E-08	358.1	4.14	1.253E-01	4.916E-04	2.560E 03	1.329E 05	4.697E 03
1350	1207	8.230E-19	2.034E-08	370.2	4.06	4.905E-02	1.684E-04	1.497E 03	1.161E 05	4.542E 03
1400	1207	7.098E-19	1.781E-08	380.7	4.00	1.943E-02	5.849E-05	8.813E 02	1.016E 05	4.393E 03
1450	1207	6.164E-19	1.564E-08	389.9	3.95	7.788E-03	2.059E-05	5.224E 02	8.914E 04	4.251E 03
1500	1207	5.382E-19	1.378E-08	398.5	3.92	3.158E-03	7.346E-06	3.117E 02	7.830E 04	4.116E 03
1550	1207	4.718E-19	1.217E-08	406.6	3.89	1.295E-03	2.655E-06	1.872E 02	6.889E 04	3.986E 03
1600	1207	4.150E-19	1.077E-08	414.4	3.87	5.373E-04	9.720E-07	1.132E 02	6.071E 04	3.862E 03
1650	1207	3.660E-19	9.559E-09	422.2	3.84	2.253E-04	3.603E-07	6.884E 01	5.358E 04	3.743E 03
1700	1207	3.236E-19	8.500E-09	429.9	3.82	9.551E-05	1.352E-07	4.213E 01	4.737E 04	3.630E 03
1750	1207	2.867E-19	7.575E-09	437.8	3.80	4.092E-05	5.136E-08	2.594E 01	4.194E 04	3.521E 03
1800	1207	2.545E-19	6.765E-09	445.8	3.78	1.771E-05	1.974E-08	1.607E 01	3.718E 04	3.417E 03
1850	1207	2.264E-19	6.053E-09	454.1	3.75	7.745E-06	7.676E-09	1.001E 01	3.302E 04	3.317E 03
1900	1207	2.017E-19	5.427E-09	462.5	3.73	3.421E-06	3.019E-09	6.273E 00	2.936E 04	3.221E 03
1950	1207	1.800E-19	4.876E-09	471.3	3.70	1.526E-06	1.201E-09	3.953E 00	2.614E 04	3.129E 03
2000	1207	1.609E-19	4.390E-09	480.4	3.68	6.872E-07	4.829E-10	2.505E 00	2.331E 04	3.040E 03
2050	1207	1.440E-19	3.960E-09	489.8	3.65	3.124E-07	1.963E-10	1.596E 00	2.082E 04	2.955E 03

TIME (IN HOURS)= 1.000, COS(TH)= 9.6593E-01, INT GRAD= 1.7284E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	513	1.175E-11	1.859E-02	16.8	26.98	1.921E 11	3.581E 10	3.450E 10	1.556E 07	2.934E 04
140	642	5.474E-12	1.100E-02	21.4	26.56	8.872E 10	1.530E 10	2.015E 10	1.149E 07	2.300E 04
150	745	3.027E-12	7.171E-03	25.3	26.16	4.849E 10	7.837E 09	1.338E 10	9.273E 06	1.949E 04
160	828	1.854E-12	4.950E-03	28.6	25.77	2.928E 10	4.471E 09	9.586E 09	7.886E 06	1.730E 04
170	893	1.213E-12	3.548E-03	31.4	25.38	1.884E 10	2.732E 09	7.212E 09	6.936E 06	1.583E 04
180	945	8.312E-13	2.613E-03	33.9	25.00	1.267E 10	1.750E 09	5.608E 09	6.241E 06	1.477E 04
190	987	5.888E-13	1.963E-03	36.1	24.61	8.784E 09	1.159E 09	4.465E 09	5.705E 06	1.398E 04
200	1021	4.277E-13	1.499E-03	38.0	24.22	6.231E 09	7.869E 08	3.616E 09	5.276E 06	1.337E 04
220	1070	2.386E-13	9.060E-04	41.4	23.44	3.288E 09	3.819E 08	2.458E 09	4.621E 06	1.248E 04
240	1104	1.404E-13	5.688E-04	44.5	22.66	1.811E 09	1.941E 08	1.725E 09	4.132E 06	1.186E 04
260	1127	8.596E-14	3.678E-04	47.3	21.89	1.025E 09	1.017E 08	1.235E 09	3.742E 06	1.140E 04
280	1142	5.427E-14	2.437E-04	49.9	21.15	5.918E 08	5.437E 07	8.964E 08	3.417E 06	1.102E 04
300	1153	3.516E-14	1.648E-04	52.4	20.45	3.462E 08	2.952E 07	6.569E 08	3.138E 06	1.072E 04
320	1161	2.329E-14	1.135E-04	54.8	19.80	2.046E 08	1.621E 07	4.848E 08	2.893E 06	1.045E 04
340	1166	1.573E-14	7.941E-05	57.1	19.21	1.219E 08	8.975E 06	3.598E 08	2.674E 06	1.021E 04
360	1170	1.081E-14	5.632E-05	59.3	18.68	7.307E 07	5.007E 06	2.681E 08	2.478E 06	9.989E 03
380	1173	7.546E-15	4.043E-05	61.3	18.21	4.405E 07	2.810E 06	2.005E 08	2.299E 06	9.786E 03
400	1175	5.339E-15	2.933E-05	63.3	17.79	2.668E 07	1.585E 06	1.504E 08	2.136E 06	9.594E 03
420	1177	3.823E-15	2.147E-05	65.1	17.42	1.623E 07	8.986E 05	1.131E 08	1.986E 06	9.412E 03
440	1178	2.767E-15	1.586E-05	66.8	17.10	9.906E 06	5.116E 05	8.523E 07	1.849E 06	9.237E 03
460	1179	2.022E-15	1.179E-05	68.4	16.81	6.069E 06	2.924E 05	6.438E 07	1.722E 06	9.069E 03
480	1180	1.489E-15	8.833E-06	69.9	16.54	3.731E 06	1.678E 05	4.873E 07	1.605E 06	8.906E 03
500	1181	1.105E-15	6.656E-06	71.4	16.30	2.301E 06	9.664E 04	3.695E 07	1.496E 06	8.749E 03
520	1181	8.252E-16	5.045E-06	72.9	16.06	1.424E 06	5.585E 04	2.807E 07	1.396E 06	8.596E 03
540	1182	6.197E-16	3.846E-06	74.5	15.83	8.835E 05	3.239E 04	2.136E 07	1.303E 06	8.447E 03
560	1182	4.679E-16	2.949E-06	76.1	15.59	5.499E 05	1.885E 04	1.628E 07	1.217E 06	8.302E 03
580	1182	3.549E-16	2.274E-06	77.8	15.35	3.433E 05	1.101E 04	1.243E 07	1.137E 06	8.160E 03
600	1183	2.704E-16	1.763E-06	79.6	15.08	2.149E 05	6.446E 03	9.511E 06	1.063E 06	8.022E 03
620	1183	2.069E-16	1.376E-06	81.6	14.80	1.349E 05	3.788E 03	7.287E 06	9.940E 05	7.887E 03
640	1183	1.590E-16	1.080E-06	83.9	14.48	8.492E 04	2.233E 03	5.591E 06	9.299E 05	7.756E 03
660	1183	1.227E-16	8.540E-07	86.4	14.13	5.360E 04	1.321E 03	4.297E 06	8.703E 05	7.628E 03
680	1183	9.506E-17	6.802E-07	89.4	13.75	3.393E 04	7.833E 02	3.308E 06	8.149E 05	7.502E 03
700	1184	7.396E-17	5.460E-07	92.7	13.33	2.153E 04	4.660E 02	2.550E 06	7.633E 05	7.380E 03
720	1184	5.781E-17	4.419E-07	96.6	12.88	1.370E 04	2.781E 02	1.969E 06	7.152E 05	7.260E 03

740	1184	4.540E-17	3.609E-07	101.0	12.38	8.740E 03	1.665E 02	1.522E 06	6.704E 05	7.143E 03
760	1184	3.583E-17	2.974E-07	106.0	11.86	5.591E 03	9.993E 01	1.179E 06	6.287E 05	7.028E 03
780	1184	2.844E-17	2.475E-07	111.8	11.31	3.585E 03	6.017E 01	9.142E 05	5.897E 05	6.917E 03
800	1184	2.270E-17	2.080E-07	118.3	10.75	2.305E 03	3.633E 01	7.100E 05	5.534E 05	6.807E 03
820	1184	1.824E-17	1.765E-07	125.7	10.18	1.485E 03	2.200E 01	5.522E 05	5.196E 05	6.700E 03
840	1184	1.476E-17	1.513E-07	133.9	9.61	9.596E 02	1.336E 01	4.301E 05	4.879E 05	6.596E 03
860	1184	1.203E-17	1.309E-07	143.0	9.05	6.215E 02	8.134E 00	3.355E 05	4.584E 05	6.493E 03
880	1184	9.877E-18	1.144E-07	152.9	8.51	4.035E 02	4.967E 00	2.620E 05	4.308E 05	6.393E 03
900	1185	8.180E-18	1.008E-07	163.6	7.99	2.626E 02	3.041E 00	2.049E 05	4.050E 05	6.295E 03
920	1185	6.832E-18	8.954E-08	175.0	7.51	1.713E 02	1.867E 00	1.605E 05	3.809E 05	6.199E 03
940	1185	5.757E-18	8.017E-08	187.0	7.07	1.120E 02	1.150E 00	1.259E 05	3.583E 05	6.105E 03
960	1185	4.896E-18	7.228E-08	199.4	6.67	7.342E 01	7.096E-01	9.885E 04	3.372E 05	6.013E 03
980	1185	4.200E-18	6.558E-08	212.0	6.31	4.823E 01	4.391E-01	7.773E 04	3.175E 05	5.923E 03
1000	1185	3.636E-18	5.984E-08	224.6	5.99	3.176E 01	2.725E-01	6.120E 04	2.990E 05	5.834E 03
1050	1185	2.632E-18	4.858E-08	255.4	5.34	1.128E 01	8.359E-02	3.386E 04	2.577E 05	5.622E 03
1100	1185	1.998E-18	4.035E-08	283.2	4.88	4.064E 00	2.605E-02	1.888E 04	2.225E 05	5.419E 03
1150	1185	1.577E-18	3.406E-08	306.9	4.56	1.484E 00	8.244E-03	1.061E 04	1.925E 05	5.227E 03
1200	1185	1.283E-18	2.909E-08	326.5	4.34	5.491E-01	2.649E-03	6.008E 03	1.669E 05	5.043E 03
1250	1185	1.068E-18	2.506E-08	342.4	4.20	2.059E-01	8.641E-04	3.428E 03	1.450E 05	4.869E 03
1300	1185	9.029E-19	2.171E-08	355.5	4.10	7.817E-02	2.860E-04	1.970E 03	1.261E 05	4.702E 03
1350	1185	7.725E-19	1.891E-08	366.6	4.02	3.006E-02	9.601E-05	1.140E 03	1.100E 05	4.544E 03
1400	1185	6.664E-19	1.652E-08	376.2	3.97	1.170E-02	3.269E-05	6.647E 02	9.602E 04	4.392E 03
1450	1185	5.786E-19	1.449E-08	384.9	3.93	4.610E-03	1.129E-05	3.901E 02	8.400E 04	4.248E 03
1500	1185	5.047E-19	1.274E-08	393.0	3.90	1.838E-03	3.949E-06	2.305E 02	7.360E 04	4.110E 03
1550	1185	4.418E-19	1.123E-08	400.8	3.87	7.414E-04	1.400E-06	1.371E 02	6.460E 04	3.978E 03
1600	1185	3.880E-19	9.928E-09	408.4	3.85	3.025E-04	5.030E-07	8.212E 01	5.679E 04	3.852E 03
1650	1185	3.416E-19	8.794E-09	416.1	3.83	1.248E-04	1.830E-07	4.949E 01	5.001E 04	3.731E 03
1700	1185	3.015E-19	7.807E-09	423.8	3.80	5.205E-05	6.742E-08	3.001E 01	4.411E 04	3.616E 03
1750	1185	2.666E-19	6.945E-09	431.7	3.78	2.194E-05	2.515E-08	1.831E 01	3.896E 04	3.505E 03
1800	1185	2.362E-19	6.192E-09	439.7	3.76	9.350E-06	9.493E-09	1.124E 01	3.447E 04	3.400E 03
1850	1185	2.097E-19	5.533E-09	448.0	3.73	4.026E-06	3.626E-09	6.940E 00	3.054E 04	3.298E 03
1900	1185	1.865E-19	4.954E-09	456.6	3.71	1.751E-06	1.401E-09	4.311E 00	2.710E 04	3.201E 03
1950	1185	1.661E-19	4.444E-09	465.5	3.68	7.692E-07	5.479E-10	2.693E 00	2.408E 04	3.108E 03
2000	1185	1.482E-19	3.996E-09	474.7	3.65	3.413E-07	2.166E-10	1.692E 00	2.142E 04	3.019E 03
2050	1185	1.324E-19	3.600E-09	484.3	3.62	1.529E-07	8.657E-11	1.069E 00	1.909E 04	2.933E 03

TIME (IN HOURS)= 2.000, COS(TH)= 8.6603E-01, INT GRAD= 1.7225E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	512	1.177E-11	1.858E-02	16.8	26.98	1.924E 11	3.586E 10	3.456E 10	1.559E 07	2.941E 04
140	639	5.489E-12	1.097E-02	21.3	26.56	8.896E 10	1.533E 10	2.023E 10	1.155E 07	2.312E 04
150	739	3.035E-12	7.132E-03	25.1	26.15	4.862E 10	7.851E 09	1.345E 10	9.345E 06	1.965E 04
160	819	1.856E-12	4.905E-03	28.3	25.76	2.931E 10	4.469E 09	9.636E 09	7.961E 06	1.749E 04
170	882	1.212E-12	3.503E-03	31.1	25.37	1.881E 10	2.722E 09	7.243E 09	7.009E 06	1.602E 04
180	932	8.280E-13	2.570E-03	33.5	24.98	1.260E 10	1.737E 09	5.625E 09	6.309E 06	1.496E 04
190	973	5.846E-13	1.924E-03	35.6	24.58	8.706E 09	1.145E 09	4.469E 09	5.767E 06	1.417E 04
200	1006	4.232E-13	1.463E-03	37.5	24.19	6.150E 09	7.737E 08	3.612E 09	5.332E 06	1.355E 04
220	1055	2.344E-13	8.789E-04	40.9	23.39	3.218E 09	3.718E 08	2.443E 09	4.665E 06	1.265E 04
240	1088	1.371E-13	5.486E-04	44.0	22.60	1.757E 09	1.871E 08	1.706E 09	4.165E 06	1.202E 04
260	1111	8.340E-14	3.530E-04	46.8	21.82	9.868E 08	9.711E 07	1.215E 09	3.767E 06	1.154E 04
280	1126	5.239E-14	2.329E-04	49.4	21.07	5.650E 08	5.147E 07	8.781E 08	3.435E 06	1.115E 04
300	1138	3.379E-14	1.569E-04	51.9	20.37	3.280E 08	2.770E 07	6.407E 08	3.150E 06	1.084E 04
320	1145	2.229E-14	1.077E-04	54.3	19.71	1.925E 08	1.508E 07	4.709E 08	2.901E 06	1.056E 04
340	1151	1.501E-14	7.510E-05	56.6	19.12	1.138E 08	8.287E 06	3.480E 08	2.679E 06	1.031E 04
360	1155	1.028E-14	5.311E-05	58.8	18.60	6.779E 07	4.587E 06	2.583E 08	2.479E 06	1.009E 04
380	1158	7.156E-15	3.801E-05	60.8	18.13	4.059E 07	2.555E 06	1.924E 08	2.298E 06	9.881E 03
400	1160	5.050E-15	2.750E-05	62.7	17.71	2.442E 07	1.430E 06	1.438E 08	2.133E 06	9.684E 03
420	1162	3.607E-15	2.008E-05	64.5	17.35	1.476E 07	8.048E 05	1.077E 08	1.981E 06	9.498E 03
440	1163	2.604E-15	1.479E-05	66.2	17.03	8.951E 06	4.548E 05	8.087E 07	1.842E 06	9.319E 03
460	1164	1.898E-15	1.097E-05	67.8	16.74	5.449E 06	2.581E 05	6.087E 07	1.714E 06	9.147E 03
480	1165	1.394E-15	8.196E-06	69.3	16.48	3.329E 06	1.470E 05	4.590E 07	1.596E 06	8.981E 03
500	1166	1.032E-15	6.161E-06	70.8	16.23	2.040E 06	8.407E 04	3.468E 07	1.487E 06	8.820E 03
520	1166	7.685E-16	4.659E-06	72.3	15.99	1.254E 06	4.825E 04	2.625E 07	1.386E 06	8.664E 03
540	1166	5.757E-16	3.543E-06	73.9	15.76	7.737E 05	2.778E 04	1.991E 07	1.293E 06	8.512E 03
560	1167	4.335E-16	2.710E-06	75.5	15.51	4.786E 05	1.605E 04	1.512E 07	1.206E 06	8.364E 03
580	1167	3.280E-16	2.086E-06	77.2	15.26	2.969E 05	9.308E 03	1.151E 07	1.126E 06	8.219E 03
600	1167	2.492E-16	1.615E-06	79.1	14.98	1.847E 05	5.415E 03	8.772E 06	1.052E 06	8.078E 03
620	1168	1.902E-16	1.258E-06	81.2	14.68	1.153E 05	3.160E 03	6.697E 06	9.826E 05	7.941E 03
640	1168	1.458E-16	9.866E-07	83.6	14.35	7.213E 04	1.850E 03	5.121E 06	9.185E 05	7.807E 03
660	1168	1.122E-16	7.794E-07	86.2	13.99	4.526E 04	1.087E 03	3.922E 06	8.589E 05	7.676E 03
680	1168	8.678E-17	6.206E-07	89.3	13.58	2.848E 04	6.402E 02	3.009E 06	8.035E 05	7.548E 03
700	1168	6.739E-17	4.982E-07	92.9	13.14	1.797E 04	3.783E 02	2.312E 06	7.519E 05	7.424E 03
720	1169	5.258E-17	4.035E-07	96.9	12.66	1.137E 04	2.243E 02	1.779E 06	7.040E 05	7.302E 03

740	1169	4.123E-17	3.298E-07	101.6	12.15	7.209E 03	1.333E 02	1.371E 06	6.593E 05	7.182E 03
760	1169	3.250E-17	2.722E-07	107.0	11.60	4.584E 03	7.952E 01	1.058E 06	6.178E 05	7.066E 03
780	1169	2.577E-17	2.270E-07	113.1	11.04	2.923E 03	4.756E 01	8.179E 05	5.790E 05	6.952E 03
800	1169	2.057E-17	1.912E-07	120.1	10.46	1.868E 03	2.853E 01	6.332E 05	5.430E 05	6.841E 03
820	1169	1.653E-17	1.626E-07	127.9	9.88	1.197E 03	1.716E 01	4.908E 05	5.093E 05	6.732E 03
840	1169	1.338E-17	1.398E-07	136.5	9.30	7.691E 02	1.036E 01	3.811E 05	4.779E 05	6.625E 03
860	1169	1.091E-17	1.213E-07	146.1	8.74	4.953E 02	6.266E 00	2.963E 05	4.486E 05	6.521E 03
880	1169	8.975E-18	1.063E-07	156.4	8.21	3.198E 02	3.802E 00	2.307E 05	4.213E 05	6.419E 03
900	1169	7.447E-18	9.393E-08	167.5	7.71	2.070E 02	2.313E 00	1.798E 05	3.957E 05	6.319E 03
920	1169	6.235E-18	8.369E-08	179.3	7.24	1.343E 02	1.411E 00	1.404E 05	3.719E 05	6.222E 03
940	1169	5.269E-18	7.513E-08	191.5	6.82	8.731E 01	8.633E-01	1.098E 05	3.496E 05	6.126E 03
960	1169	4.494E-18	6.790E-08	204.0	6.44	5.691E 01	5.296E-01	8.592E 04	3.287E 05	6.032E 03
980	1169	3.869E-18	6.174E-08	216.6	6.09	3.718E 01	3.257E-01	6.735E 04	3.092E 05	5.941E 03
1000	1169	3.361E-18	5.644E-08	229.2	5.79	2.435E 01	2.009E-01	5.287E 04	2.910E 05	5.851E 03
1050	1169	2.454E-18	4.599E-08	259.3	5.19	8.536E 00	6.068E-02	2.902E 04	2.503E 05	5.635E 03
1100	1169	1.878E-18	3.829E-08	285.9	4.77	3.034E 00	1.863E-02	1.606E 04	2.157E 05	5.430E 03
1150	1169	1.492E-18	3.236E-08	308.3	4.48	1.094E 00	5.808E-03	8.960E 03	1.863E 05	5.234E 03
1200	1169	1.219E-18	2.765E-08	326.5	4.29	3.995E-01	1.839E-03	5.036E 03	1.612E 05	5.048E 03
1250	1169	1.018E-18	2.380E-08	341.3	4.16	1.479E-01	5.912E-04	2.852E 03	1.398E 05	4.871E 03
1300	1169	8.621E-19	2.061E-08	353.5	4.07	5.546E-02	1.929E-04	1.628E 03	1.214E 05	4.703E 03
1350	1169	7.381E-19	1.793E-08	363.9	4.00	2.106E-02	6.385E-05	9.354E 02	1.056E 05	4.542E 03
1400	1169	6.369E-19	1.566E-08	373.0	3.96	8.099E-03	2.144E-05	5.415E 02	9.209E 04	4.389E 03
1450	1169	5.527E-19	1.371E-08	381.3	3.92	3.153E-03	7.299E-06	3.156E 02	8.042E 04	4.242E 03
1500	1169	4.817E-19	1.204E-08	389.2	3.89	1.242E-03	2.520E-06	1.853E 02	7.034E 04	4.103E 03
1550	1169	4.213E-19	1.061E-08	396.8	3.86	4.952E-04	8.815E-07	1.095E 02	6.164E 04	3.970E 03
1600	1169	3.695E-19	9.362E-09	404.4	3.84	1.997E-04	3.125E-07	6.511E 01	5.410E 04	3.842E 03
1650	1169	3.249E-19	8.282E-09	412.0	3.81	8.144E-05	1.122E-07	3.898E 01	4.756E 04	3.720E 03
1700	1169	2.864E-19	7.344E-09	419.7	3.79	3.358E-05	4.081E-08	2.349E 01	4.188E 04	3.604E 03
1750	1169	2.529E-19	6.526E-09	427.6	3.77	1.400E-05	1.503E-08	1.424E 01	3.693E 04	3.492E 03
1800	1169	2.238E-19	5.812E-09	435.7	3.74	5.901E-06	5.602E-09	8.685E 00	3.262E 04	3.386E 03
1850	1169	1.984E-19	5.188E-09	444.0	3.72	2.513E-06	2.113E-09	5.330E 00	2.886E 04	3.283E 03
1900	1169	1.762E-19	4.640E-09	452.7	3.69	1.081E-06	8.068E-10	3.290E 00	2.556E 04	3.186E 03
1950	1169	1.567E-19	4.159E-09	461.7	3.66	4.700E-07	3.116E-10	2.043E 00	2.268E 04	3.092E 03
2000	1169	1.396E-19	3.737E-09	471.1	3.63	2.063E-07	1.217E-10	1.276E 00	2.015E 04	3.002E 03
2050	1169	1.246E-19	3.364E-09	480.8	3.60	9.148E-08	4.807E-11	8.010E-01	1.793E 04	2.915E 03

TIME (IN HOURS)= 3.000, COS(TH)= 7.0711E-01, INT GRAD= 1.7139E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	511	1.179E-11	1.856E-02	16.7	26.98	1.928E 11	3.592E 10	3.463E 10	1.563E 07	2.948E 04
140	635	5.503E-12	1.094E-02	21.2	26.55	8.919E 10	1.536E 10	2.030E 10	1.161E 07	2.325E 04
150	733	3.042E-12	7.091E-03	24.9	26.15	4.871E 10	7.859E 09	1.351E 10	9.412E 06	1.981E 04
160	811	1.857E-12	4.861E-03	28.1	25.75	2.931E 10	4.463E 09	9.676E 09	8.028E 06	1.765E 04
170	872	1.210E-12	3.460E-03	30.7	25.35	1.876E 10	2.710E 09	7.266E 09	7.071E 06	1.619E 04
180	922	8.238E-13	2.530E-03	33.1	24.96	1.253E 10	1.722E 09	5.632E 09	6.365E 06	1.513E 04
190	962	5.798E-13	1.888E-03	35.2	24.56	8.622E 09	1.131E 09	4.466E 09	5.817E 06	1.433E 04
200	994	4.184E-13	1.432E-03	37.1	24.16	6.068E 09	7.607E 08	3.602E 09	5.375E 06	1.370E 04
220	1043	2.304E-13	8.559E-04	40.6	23.35	3.152E 09	3.625E 08	2.426E 09	4.695E 06	1.278E 04
240	1077	1.340E-13	5.322E-04	43.6	22.54	1.709E 09	1.811E 08	1.686E 09	4.185E 06	1.212E 04
260	1100	8.118E-14	3.413E-04	46.4	21.76	9.540E 08	9.330E 07	1.197E 09	3.779E 06	1.163E 04
280	1116	5.081E-14	2.246E-04	49.1	21.00	5.431E 08	4.914E 07	8.618E 08	3.442E 06	1.124E 04
300	1128	3.268E-14	1.510E-04	51.7	20.30	3.137E 08	2.630E 07	6.268E 08	3.153E 06	1.091E 04
320	1136	2.151E-14	1.034E-04	54.1	19.65	1.832E 08	1.424E 07	4.594E 08	2.900E 06	1.062E 04
340	1142	1.445E-14	7.201E-05	56.4	19.06	1.079E 08	7.784E 06	3.386E 08	2.676E 06	1.037E 04
360	1146	9.887E-15	5.084E-05	58.5	18.53	6.397E 07	4.288E 06	2.507E 08	2.475E 06	1.014E 04
380	1149	6.871E-15	3.634E-05	60.6	18.07	3.815E 07	2.377E 06	1.863E 08	2.292E 06	9.931E 03
400	1152	4.842E-15	2.625E-05	62.5	17.66	2.286E 07	1.325E 06	1.389E 08	2.126E 06	9.731E 03
420	1153	3.454E-15	1.915E-05	64.2	17.30	1.376E 07	7.423E 05	1.038E 08	1.974E 06	9.542E 03
440	1155	2.490E-15	1.408E-05	65.9	16.98	8.316E 06	4.177E 05	7.779E 07	1.834E 06	9.361E 03
460	1156	1.812E-15	1.043E-05	67.5	16.69	5.044E 06	2.361E 05	5.842E 07	1.706E 06	9.187E 03
480	1156	1.330E-15	7.782E-06	69.0	16.43	3.070E 06	1.339E 05	4.396E 07	1.588E 06	9.019E 03
500	1157	9.829E-16	5.842E-06	70.5	16.19	1.875E 06	7.626E 04	3.315E 07	1.478E 06	8.856E 03
520	1158	7.310E-16	4.412E-06	72.0	15.95	1.149E 06	4.358E 04	2.504E 07	1.377E 06	8.697E 03
540	1158	5.468E-16	3.352E-06	73.5	15.71	7.059E 05	2.500E 04	1.895E 07	1.284E 06	8.544E 03
560	1158	4.112E-16	2.561E-06	75.2	15.46	4.351E 05	1.439E 04	1.437E 07	1.197E 06	8.394E 03
580	1159	3.106E-16	1.969E-06	76.9	15.20	2.690E 05	8.308E 03	1.091E 07	1.117E 06	8.248E 03
600	1159	2.358E-16	1.523E-06	78.9	14.92	1.668E 05	4.813E 03	8.300E 06	1.043E 06	8.106E 03
620	1159	1.797E-16	1.186E-06	81.0	14.61	1.037E 05	2.798E 03	6.324E 06	9.739E 05	7.967E 03
640	1159	1.376E-16	9.296E-07	83.5	14.26	6.468E 04	1.632E 03	4.826E 06	9.099E 05	7.832E 03
660	1160	1.058E-16	7.343E-07	86.2	13.89	4.045E 04	9.546E 02	3.689E 06	8.504E 05	7.699E 03
680	1160	8.167E-17	5.847E-07	89.4	13.47	2.536E 04	5.602E 02	2.825E 06	7.952E 05	7.570E 03
700	1160	6.336E-17	4.696E-07	93.1	13.01	1.595E 04	3.298E 02	2.166E 06	7.438E 05	7.444E 03
720	1160	4.939E-17	3.806E-07	97.3	12.52	1.005E 04	1.948E 02	1.664E 06	6.960E 05	7.321E 03

740	1160	3.870E-17	3.114E-07	102.2	11.99	6.355E 03	1.154E 02	1.280E 06	6.516E 05	7.200E 03
760	1160	3.050E-17	2.574E-07	107.8	11.43	4.028E 03	6.853E 01	9.858E 05	6.102E 05	7.083E 03
780	1160	2.418E-17	2.149E-07	114.2	10.86	2.560E 03	4.084E 01	7.605E 05	5.717E 05	6.968E 03
800	1161	1.930E-17	1.813E-07	121.4	10.27	1.631E 03	2.441E 01	5.876E 05	5.358E 05	6.855E 03
820	1161	1.551E-17	1.545E-07	129.4	9.69	1.042E 03	1.463E 01	4.547E 05	5.024E 05	6.745E 03
840	1161	1.256E-17	1.331E-07	138.4	9.11	6.670E 02	8.793E 00	3.524E 05	4.712E 05	6.638E 03
860	1161	1.026E-17	1.157E-07	148.2	8.55	4.282E 02	5.300E 00	2.734E 05	4.421E 05	6.533E 03
880	1161	8.448E-18	1.016E-07	158.8	8.03	2.756E 02	3.204E 00	2.125E 05	4.149E 05	6.430E 03
900	1161	7.020E-18	8.995E-08	170.2	7.53	1.778E 02	1.942E 00	1.654E 05	3.896E 05	6.329E 03
920	1161	5.888E-18	8.029E-08	182.1	7.08	1.150E 02	1.181E 00	1.289E 05	3.659E 05	6.231E 03
940	1161	4.986E-18	7.219E-08	194.5	6.67	7.452E 01	7.197E-01	1.006E 05	3.438E 05	6.134E 03
960	1161	4.262E-18	6.534E-08	207.0	6.30	4.842E 01	4.399E-01	7.858E 04	3.232E 05	6.040E 03
980	1161	3.677E-18	5.950E-08	219.7	5.97	3.154E 01	2.696E-01	6.149E 04	3.039E 05	5.948E 03
1000	1161	3.202E-18	5.445E-08	232.2	5.68	2.059E 01	1.657E-01	4.818E 04	2.858E 05	5.857E 03
1050	1161	2.351E-18	4.447E-08	261.7	5.10	7.163E 00	4.961E-02	2.634E 04	2.456E 05	5.639E 03
1100	1161	1.808E-18	3.707E-08	287.6	4.71	2.527E 00	1.510E-02	1.451E 04	2.115E 05	5.432E 03
1150	1161	1.442E-18	3.136E-08	309.1	4.44	9.040E-01	4.668E-03	8.060E 03	1.824E 05	5.235E 03
1200	1161	1.182E-18	2.680E-08	326.5	4.26	3.278E-01	1.466E-03	4.511E 03	1.577E 05	5.048E 03
1250	1161	9.881E-19	2.307E-08	340.7	4.13	1.205E-01	4.672E-04	2.545E 03	1.366E 05	4.870E 03
1300	1161	8.379E-19	1.997E-08	352.4	4.05	4.485E-02	1.512E-04	1.446E 03	1.185E 05	4.700E 03
1350	1161	7.177E-19	1.736E-08	362.3	3.99	1.691E-02	4.964E-05	8.277E 02	1.030E 05	4.538E 03
1400	1161	6.192E-19	1.515E-08	371.2	3.95	6.458E-03	1.654E-05	4.772E 02	8.970E 04	4.384E 03
1450	1161	5.372E-19	1.326E-08	379.4	3.91	2.497E-03	5.586E-06	2.771E 02	7.825E 04	4.237E 03
1500	1161	4.680E-19	1.164E-08	387.1	3.88	9.769E-04	1.913E-06	1.620E 02	6.839E 04	4.096E 03
1550	1161	4.090E-19	1.024E-08	394.7	3.86	3.868E-04	6.642E-07	9.535E 01	5.986E 04	3.962E 03
1600	1161	3.585E-19	9.033E-09	402.2	3.83	1.550E-04	2.337E-07	5.650E 01	5.249E 04	3.834E 03
1650	1161	3.151E-19	7.986E-09	409.7	3.81	6.278E-05	8.328E-08	3.370E 01	4.610E 04	3.712E 03
1700	1161	2.775E-19	7.077E-09	417.4	3.78	2.572E-05	3.006E-08	2.023E 01	4.056E 04	3.595E 03
1750	1161	2.448E-19	6.285E-09	425.3	3.76	1.066E-05	1.099E-08	1.222E 01	3.573E 04	3.483E 03
1800	1161	2.165E-19	5.594E-09	433.5	3.74	4.463E-06	4.067E-09	7.426E 00	3.153E 04	3.376E 03
1850	1161	1.918E-19	4.990E-09	441.9	3.71	1.889E-06	1.524E-09	4.541E 00	2.787E 04	3.273E 03
1900	1161	1.702E-19	4.461E-09	450.6	3.68	8.076E-07	5.775E-10	2.793E 00	2.467E 04	3.175E 03
1950	1161	1.513E-19	3.997E-09	459.7	3.65	3.489E-07	2.215E-10	1.728E 00	2.187E 04	3.080E 03
2000	1161	1.347E-19	3.589E-09	469.1	3.62	1.523E-07	8.592E-11	1.075E 00	1.941E 04	2.990E 03
2050	1161	1.201E-19	3.230E-09	479.0	3.59	6.710E-08	3.371E-11	6.729E-01	1.725E 04	2.903E 03

TIME (IN HOURS)= 4.000, COS(TH)= 5.0000E-01, INT GRAD= 1.7032E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	509	1.181E-11	1.855E-02	16.7	26.98	1.931E 11	3.598E 10	3.471E 10	1.567E 07	2.956E 04
140	632	5.516E-12	1.091E-02	21.1	26.55	8.939E 10	1.539E 10	2.038E 10	1.167E 07	2.337E 04
150	728	3.046E-12	7.051E-03	24.7	26.14	4.876E 10	7.861E 09	1.356E 10	9.472E 06	1.994E 04
160	804	1.856E-12	4.820E-03	27.8	25.74	2.928E 10	4.452E 09	9.705E 09	8.083E 06	1.779E 04
170	865	1.206E-12	3.421E-03	30.5	25.34	1.869E 10	2.694E 09	7.276E 09	7.119E 06	1.632E 04
180	914	8.189E-13	2.496E-03	32.9	24.94	1.244E 10	1.706E 09	5.630E 09	6.404E 06	1.525E 04
190	954	5.747E-13	1.858E-03	35.0	24.53	8.534E 09	1.116E 09	4.455E 09	5.847E 06	1.443E 04
200	987	4.136E-13	1.407E-03	36.9	24.13	5.988E 09	7.485E 08	3.585E 09	5.397E 06	1.379E 04
220	1038	2.267E-13	8.387E-04	40.4	23.31	3.093E 09	3.545E 08	2.406E 09	4.705E 06	1.284E 04
240	1073	1.314E-13	5.207E-04	43.5	22.50	1.670E 09	1.762E 08	1.667E 09	4.186E 06	1.216E 04
260	1097	7.944E-14	3.337E-04	46.4	21.72	9.292E 08	9.051E 07	1.180E 09	3.773E 06	1.165E 04
280	1115	4.966E-14	2.196E-04	49.1	20.96	5.279E 08	4.755E 07	8.484E 08	3.432E 06	1.124E 04
300	1127	3.192E-14	1.477E-04	51.7	20.26	3.045E 08	2.541E 07	6.164E 08	3.141E 06	1.090E 04
320	1136	2.101E-14	1.012E-04	54.2	19.61	1.776E 08	1.375E 07	4.513E 08	2.888E 06	1.061E 04
340	1142	1.412E-14	7.052E-05	56.5	19.03	1.046E 08	7.512E 06	3.325E 08	2.663E 06	1.036E 04
360	1147	9.667E-15	4.983E-05	58.7	18.50	6.200E 07	4.138E 06	2.462E 08	2.462E 06	1.013E 04
380	1150	6.723E-15	3.564E-05	60.7	18.04	3.698E 07	2.295E 06	1.829E 08	2.280E 06	9.911E 03
400	1153	4.741E-15	2.577E-05	62.6	17.64	2.217E 07	1.280E 06	1.364E 08	2.115E 06	9.710E 03
420	1155	3.385E-15	1.881E-05	64.4	17.28	1.335E 07	7.173E 05	1.020E 08	1.963E 06	9.520E 03
440	1156	2.442E-15	1.384E-05	66.0	16.96	8.073E 06	4.039E 05	7.643E 07	1.825E 06	9.339E 03
460	1157	1.779E-15	1.026E-05	67.6	16.68	4.900E 06	2.284E 05	5.742E 07	1.697E 06	9.165E 03
480	1158	1.306E-15	7.659E-06	69.2	16.42	2.984E 06	1.297E 05	4.323E 07	1.579E 06	8.997E 03
500	1159	9.659E-16	5.753E-06	70.7	16.17	1.824E 06	7.389E 04	3.261E 07	1.471E 06	8.835E 03
520	1159	7.188E-16	4.348E-06	72.2	15.93	1.118E 06	4.226E 04	2.464E 07	1.370E 06	8.677E 03
540	1160	5.380E-16	3.305E-06	73.7	15.70	6.875E 05	2.426E 04	1.866E 07	1.278E 06	8.524E 03
560	1160	4.048E-16	2.527E-06	75.3	15.45	4.241E 05	1.397E 04	1.415E 07	1.192E 06	8.375E 03
580	1160	3.060E-16	1.944E-06	77.1	15.19	2.624E 05	8.075E 03	1.075E 07	1.112E 06	8.229E 03
600	1161	2.324E-16	1.504E-06	79.1	14.90	1.628E 05	4.682E 03	8.180E 06	1.038E 06	8.088E 03
620	1161	1.772E-16	1.172E-06	81.2	14.59	1.013E 05	2.724E 03	6.235E 06	9.694E 05	7.949E 03
640	1161	1.357E-16	9.195E-07	83.7	14.25	6.321E 04	1.590E 03	4.760E 06	9.058E 05	7.814E 03
660	1161	1.044E-16	7.268E-07	86.5	13.87	3.955E 04	9.308E 02	3.640E 06	8.467E 05	7.683E 03
680	1161	8.065E-17	5.791E-07	89.7	13.45	2.482E 04	5.467E 02	2.788E 06	7.917E 05	7.554E 03
700	1162	6.260E-17	4.653E-07	93.4	12.99	1.562E 04	3.221E 02	2.139E 06	7.407E 05	7.428E 03
720	1162	4.882E-17	3.774E-07	97.6	12.50	9.851E 03	1.903E 02	1.643E 06	6.932E 05	7.306E 03

740	1162	3.828E-17	3.090E-07	102.5	11.97	6.232E 03	1.128E 02	1.265E 06	6.490E 05	7.186E 03
760	1162	3.018E-17	2.555E-07	108.2	11.41	5.952E 03	6.707E 01	9.745E 05	6.078E 05	7.068E 03
780	1162	2.394E-17	2.135E-07	114.6	10.84	2.513E 03	4.000E 01	7.521E 05	5.695E 05	6.954E 03
800	1162	1.912E-17	1.802E-07	121.8	10.25	1.602E 03	2.392E 01	5.813E 05	5.338E 05	6.842E 03
820	1162	1.537E-17	1.537E-07	129.9	9.67	1.024E 03	1.435E 01	4.500E 05	5.005E 05	6.732E 03
840	1162	1.246E-17	1.324E-07	138.9	9.09	6.561E 02	8.630E 00	3.488E 05	4.695E 05	6.625E 03
860	1162	1.018E-17	1.152E-07	148.7	8.54	4.214E 02	5.206E 00	2.708E 05	4.405E 05	6.520E 03
880	1162	8.386E-18	1.012E-07	159.4	8.01	2.714E 02	3.149E 00	2.105E 05	4.135E 05	6.418E 03
900	1162	6.972E-18	8.963E-08	170.7	7.52	1.752E 02	1.910E 00	1.639E 05	3.883E 05	6.317E 03
920	1163	5.851E-18	8.003E-08	182.7	7.07	1.134E 02	1.162E 00	1.278E 05	3.648E 05	6.219E 03
940	1163	4.956E-18	7.199E-08	195.0	6.65	7.353E 01	7.089E-01	9.973E 04	3.428E 05	6.123E 03
960	1163	4.238E-18	6.518E-08	207.6	6.29	4.781E 01	4.336E-01	7.796E 04	3.222E 05	6.029E 03
980	1163	3.659E-18	5.936E-08	220.3	5.96	3.116E 01	2.659E-01	6.103E 04	3.030E 05	5.937E 03
1000	1163	3.187E-18	5.434E-08	232.8	5.67	2.035E 01	1.635E-01	4.783E 04	2.850E 05	5.847E 03
1050	1163	2.342E-18	4.440E-08	262.3	5.10	7.090E 00	4.905E-02	2.617E 04	2.449E 05	5.630E 03
1100	1163	1.802E-18	3.703E-08	288.1	4.70	2.505E 00	1.495E-02	1.445E 04	2.109E 05	5.423E 03
1150	1163	1.438E-18	3.133E-08	309.6	4.44	8.974E-01	4.630E-03	8.021E 03	1.820E 05	5.227E 03
1200	1163	1.179E-18	2.678E-08	327.0	4.26	3.259E-01	1.456E-03	4.494E 03	1.574E 05	5.040E 03
1250	1163	9.862E-19	2.306E-08	341.2	4.13	1.199E-01	4.649E-04	2.536E 03	1.363E 05	4.862E 03
1300	1163	8.365E-19	1.996E-08	352.9	4.05	4.471E-02	1.507E-04	1.442E 03	1.183E 05	4.693E 03
1350	1163	7.166E-19	1.736E-08	362.8	3.99	1.688E-02	4.955E-05	8.265E 02	1.029E 05	4.532E 03
1400	1163	6.184E-19	1.515E-08	371.7	3.95	6.455E-03	1.653E-05	4.768E 02	8.959E 04	4.378E 03
1450	1163	5.366E-19	1.326E-08	379.9	3.91	2.499E-03	5.593E-06	2.770E 02	7.817E 04	4.231E 03
1500	1163	4.676E-19	1.164E-08	387.6	3.88	9.791E-04	1.918E-06	1.621E 02	6.833E 04	4.091E 03
1550	1163	4.088E-19	1.025E-08	395.2	3.86	3.882E-04	6.670E-07	9.548E 01	5.982E 04	3.957E 03
1600	1163	3.584E-19	9.041E-09	402.7	3.83	1.557E-04	2.350E-07	5.662E 01	5.246E 04	3.830E 03
1650	1163	3.150E-19	7.994E-09	410.3	3.81	6.316E-05	8.387E-08	3.379E 01	4.609E 04	3.708E 03
1700	1163	2.774E-19	7.085E-09	418.0	3.78	2.591E-05	3.032E-08	2.030E 01	4.055E 04	3.591E 03
1750	1163	2.448E-19	6.293E-09	425.9	3.76	1.075E-05	1.110E-08	1.227E 01	3.574E 04	3.479E 03
1800	1163	2.165E-19	5.602E-09	434.0	3.74	4.506E-06	4.113E-09	7.462E 00	3.154E 04	3.372E 03
1850	1163	1.918E-19	4.998E-09	442.4	3.71	1.909E-06	1.543E-09	4.566E 00	2.788E 04	3.270E 03
1900	1163	1.702E-19	4.469E-09	451.2	3.68	8.174E-07	5.857E-10	2.811E 00	2.468E 04	3.172E 03
1950	1163	1.514E-19	4.005E-09	460.3	3.65	3.536E-07	2.249E-10	1.740E 00	2.188E 04	3.078E 03
2000	1163	1.348E-19	3.596E-09	469.7	3.62	1.545E-07	8.736E-11	1.084E 00	1.943E 04	2.987E 03
2050	1163	1.202E-19	3.237E-09	479.6	3.59	6.815E-08	3.432E-11	6.785E-01	1.727E 04	2.901E 03

TIME (IN HOURS)= 5.000, COS(TH)= 2.5882E-01, INT GRAD= 1.6910E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	508	1.183E-11	1.853E-02	16.6	26.98	1.934E 11	3.603E 10	3.478E 10	1.571E 07	2.964E 04
140	629	5.525E-12	1.088E-02	21.0	26.55	8.953E 10	1.541E 10	2.044E 10	1.172E 07	2.548E 04
150	724	3.047E-12	7.015E-03	24.6	26.14	4.877E 10	7.856E 09	1.359E 10	9.517E 06	2.005E 04
160	800	1.852E-12	4.786E-03	27.7	25.73	2.921E 10	4.438E 09	9.715E 09	8.119E 06	1.789E 04
170	861	1.200E-12	3.391E-03	30.4	25.33	1.860E 10	2.677E 09	7.270E 09	7.145E 06	1.639E 04
180	911	8.131E-13	2.471E-03	32.8	24.93	1.234E 10	1.690E 09	5.613E 09	6.416E 06	1.529E 04
190	953	5.693E-13	1.839E-03	34.9	24.52	8.447E 09	1.103E 09	4.433E 09	5.848E 06	1.445E 04
200	987	4.090E-13	1.392E-03	36.9	24.11	5.915E 09	7.380E 08	3.560E 09	5.389E 06	1.378E 04
220	1041	2.236E-13	8.308E-04	40.5	23.30	3.048E 09	3.488E 08	2.382E 09	4.682E 06	1.279E 04
240	1079	1.296E-13	5.171E-04	43.8	22.49	1.646E 09	1.734E 08	1.648E 09	4.154E 06	1.208E 04
260	1107	7.846E-14	3.326E-04	46.8	21.71	9.171E 08	8.927E 07	1.167E 09	3.738E 06	1.154E 04
280	1127	4.917E-14	2.197E-04	49.7	20.96	5.227E 08	4.710E 07	8.398E 08	3.396E 06	1.112E 04
300	1141	3.171E-14	1.484E-04	52.3	20.27	3.029E 08	2.531E 07	6.114E 08	3.106E 06	1.077E 04
320	1151	2.096E-14	1.022E-04	54.9	19.63	1.777E 08	1.378E 07	4.489E 08	2.855E 06	1.048E 04
340	1159	1.414E-14	7.154E-05	57.2	19.05	1.053E 08	7.588E 06	3.319E 08	2.634E 06	1.022E 04
360	1164	9.722E-15	5.078E-05	59.4	18.53	6.286E 07	4.213E 06	2.466E 08	2.436E 06	9.988E 03
380	1168	6.790E-15	3.648E-05	61.5	18.07	3.777E 07	2.355E 06	1.840E 08	2.258E 06	9.776E 03
400	1171	4.809E-15	2.649E-05	63.5	17.67	2.281E 07	1.325E 06	1.377E 08	2.096E 06	9.578E 03
420	1173	3.447E-15	1.941E-05	65.3	17.31	1.384E 07	7.490E 05	1.034E 08	1.948E 06	9.391E 03
440	1174	2.498E-15	1.435E-05	66.9	17.00	8.433E 06	4.255E 05	7.785E 07	1.812E 06	9.214E 03
460	1175	1.826E-15	1.068E-05	68.5	16.71	5.158E 06	2.427E 05	5.874E 07	1.687E 06	9.044E 03
480	1176	1.346E-15	8.003E-06	70.1	16.46	3.165E 06	1.390E 05	4.441E 07	1.571E 06	8.881E 03
500	1177	9.996E-16	6.034E-06	71.6	16.21	1.949E 06	7.991E 04	3.364E 07	1.465E 06	8.722E 03
520	1178	7.469E-16	4.577E-06	73.1	15.98	1.204E 06	4.611E 04	2.554E 07	1.367E 06	8.569E 03
540	1178	5.612E-16	3.491E-06	74.7	15.74	7.462E 05	2.670E 04	1.942E 07	1.275E 06	8.420E 03
560	1178	4.238E-16	2.678E-06	76.3	15.50	4.638E 05	1.551E 04	1.479E 07	1.191E 06	8.274E 03
580	1179	3.216E-16	2.067E-06	78.0	15.25	2.891E 05	9.042E 03	1.129E 07	1.112E 06	8.133E 03
600	1179	2.451E-16	1.604E-06	79.9	14.98	1.807E 05	5.288E 03	8.625E 06	1.040E 06	7.995E 03
620	1179	1.876E-16	1.253E-06	82.0	14.68	1.133E 05	3.102E 03	6.603E 06	9.719E 05	7.861E 03
640	1180	1.442E-16	9.852E-07	84.4	14.35	7.122E 04	1.826E 03	5.062E 06	9.090E 05	7.729E 03
660	1180	1.113E-16	7.801E-07	87.1	13.99	4.490E 04	1.078E 03	3.888E 06	8.506E 05	7.601E 03
680	1180	8.622E-17	6.225E-07	90.2	13.59	2.838E 04	6.385E 02	2.990E 06	7.963E 05	7.476E 03
700	1180	6.712E-17	5.007E-07	93.7	13.15	1.799E 04	3.793E 02	2.303E 06	7.457E 05	7.353E 03
720	1180	5.249E-17	4.063E-07	97.8	12.68	1.143E 04	2.260E 02	1.777E 06	6.986E 05	7.234E 03

740	1180	4.125E-17	3.327E-07	102.4	12.17	7.281E 03	1.351E 02	1.373E 06	6.547E 05	7.117E 03
760	1180	3.259E-17	2.750E-07	107.8	11.63	4.651E 03	8.096E 01	1.062E 06	6.138E 05	7.002E 03
780	1181	2.590E-17	2.296E-07	113.9	11.07	2.979E 03	4.867E 01	8.233E 05	5.757E 05	6.891E 03
800	1181	2.071E-17	1.935E-07	120.8	10.50	1.912E 03	2.934E 01	6.390E 05	5.402E 05	6.781E 03
820	1181	1.667E-17	1.648E-07	128.5	9.93	1.231E 03	1.774E 01	4.966E 05	5.070E 05	6.674E 03
840	1181	1.351E-17	1.418E-07	137.1	9.36	7.942E 02	1.076E 01	3.865E 05	4.761E 05	6.570E 03
860	1181	1.103E-17	1.231E-07	146.5	8.80	5.137E 02	6.541E 00	3.012E 05	4.472E 05	6.467E 03
880	1181	9.087E-18	1.079E-07	156.8	8.27	3.331E 02	3.988E 00	2.351E 05	4.202E 05	6.367E 03
900	1181	7.546E-18	9.537E-08	167.9	7.77	2.165E 02	2.438E 00	1.837E 05	3.949E 05	6.269E 03
920	1181	6.323E-18	8.499E-08	179.5	7.30	1.410E 02	1.495E 00	1.438E 05	3.713E 05	6.173E 03
940	1181	5.345E-18	7.630E-08	191.7	6.88	9.211E 01	9.190E-01	1.127E 05	3.493E 05	6.079E 03
960	1181	4.561E-18	6.897E-08	204.2	6.49	6.030E 01	5.665E-01	8.843E 04	3.287E 05	5.988E 03
980	1181	3.926E-18	6.271E-08	216.8	6.15	3.956E 01	3.501E-01	6.949E 04	3.093E 05	5.897E 03
1000	1181	3.411E-18	5.734E-08	229.5	5.84	2.602E 01	2.169E-01	5.467E 04	2.913E 05	5.809E 03
1050	1181	2.489E-18	4.673E-08	259.8	5.23	9.214E 00	6.630E-02	3.019E 04	2.509E 05	5.597E 03
1100	1181	1.903E-18	3.892E-08	286.8	4.80	3.309E 00	2.059E-02	1.681E 04	2.166E 05	5.395E 03
1150	1181	1.511E-18	3.292E-08	309.6	4.51	1.205E 00	6.495E-03	9.429E 03	1.873E 05	5.202E 03
1200	1181	1.235E-18	2.815E-08	328.3	4.31	4.445E-01	2.080E-03	5.330E 03	1.623E 05	5.019E 03
1250	1181	1.030E-18	2.426E-08	343.5	4.17	1.661E-01	6.761E-04	3.036E 03	1.409E 05	4.845E 03
1300	1181	8.730E-19	2.103E-08	356.1	4.08	6.291E-02	2.230E-04	1.742E 03	1.226E 05	4.679E 03
1350	1181	7.478E-19	1.831E-08	366.7	4.01	2.412E-02	7.464E-05	1.007E 03	1.068E 05	4.521E 03
1400	1181	6.457E-19	1.600E-08	376.1	3.96	9.363E-03	2.533E-05	5.858E 02	9.323E 04	4.370E 03
1450	1181	5.608E-19	1.403E-08	384.6	3.92	3.679E-03	8.718E-06	3.433E 02	8.152E 04	4.225E 03
1500	1181	4.892E-19	1.234E-08	392.6	3.89	1.463E-03	3.041E-06	2.026E 02	7.141E 04	4.088E 03
1550	1181	4.283E-19	1.088E-08	400.3	3.87	5.884E-04	1.075E-06	1.203E 02	6.265E 04	3.956E 03
1600	1181	3.761E-19	9.610E-09	407.9	3.84	2.394E-04	3.849E-07	7.193E 01	5.506E 04	3.831E 03
1650	1181	3.311E-19	8.511E-09	415.5	3.82	9.850E-05	1.396E-07	4.328E 01	4.846E 04	3.710E 03
1700	1181	2.921E-19	7.555E-09	423.2	3.80	4.098E-05	5.129E-08	2.621E 01	4.273E 04	3.595E 03
1750	1181	2.583E-19	6.720E-09	431.1	3.77	1.723E-05	1.907E-08	1.597E 01	3.773E 04	3.485E 03
1800	1181	2.288E-19	5.991E-09	439.2	3.75	7.325E-06	7.180E-09	9.787E 00	3.336E 04	3.380E 03
1850	1181	2.030E-19	5.352E-09	447.6	3.73	3.146E-06	2.735E-09	6.035E 00	2.955E 04	3.279E 03
1900	1181	1.805E-19	4.791E-09	456.2	3.70	1.365E-06	1.054E-09	3.743E 00	2.621E 04	3.182E 03
1950	1181	1.607E-19	4.298E-09	465.2	3.67	5.981E-07	4.109E-10	2.335E 00	2.328E 04	3.089E 03
2000	1181	1.434E-19	3.864E-09	474.5	3.64	2.647E-07	1.620E-10	1.465E 00	2.071E 04	3.000E 03
2050	1181	1.281E-19	3.482E-09	484.2	3.61	1.183E-07	6.457E-11	9.240E-01	1.845E 04	2.914E 03

TIME (IN HOURS)= 6.000, COS(TH)= 1.1176E-06, INT GRAD= 1.6783E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	507	1.185E-11	1.851E-02	16.6	26.98	1.937E 11	3.608E 10	3.485E 10	1.574E 07	2.971E 04
140	627	5.530E-12	1.085E-02	20.9	26.55	8.961E 10	1.542E 10	2.048E 10	1.175E 07	2.356E 04
150	721	3.044E-12	6.987E-03	24.5	26.13	4.872E 10	7.843E 09	1.360E 10	9.543E 06	2.012E 04
160	798	1.846E-12	4.762E-03	27.6	25.73	2.911E 10	4.418E 09	9.703E 09	8.128E 06	1.792E 04
170	861	1.193E-12	3.374E-03	30.4	25.32	1.848E 10	2.659E 09	7.243E 09	7.135E 06	1.638E 04
180	914	8.067E-13	2.460E-03	32.9	24.92	1.224E 10	1.675E 09	5.580E 09	6.391E 06	1.524E 04
190	958	5.640E-13	1.833E-03	35.1	24.52	8.366E 09	1.092E 09	4.397E 09	5.810E 06	1.436E 04
200	996	4.049E-13	1.391E-03	37.3	24.11	5.855E 09	7.304E 08	3.526E 09	5.340E 06	1.366E 04
220	1056	2.216E-13	8.348E-04	41.1	23.31	3.022E 09	3.461E 08	2.356E 09	4.619E 06	1.261E 04
240	1100	1.289E-13	5.235E-04	44.6	22.51	1.640E 09	1.732E 08	1.632E 09	4.086E 06	1.186E 04
260	1132	7.847E-14	3.396E-04	47.8	21.75	9.212E 08	9.001E 07	1.159E 09	3.670E 06	1.130E 04
280	1155	4.953E-14	2.263E-04	50.8	21.02	5.304E 08	4.806E 07	8.379E 08	3.331E 06	1.086E 04
300	1172	3.219E-14	1.543E-04	53.6	20.33	3.110E 08	2.618E 07	6.136E 08	3.047E 06	1.051E 04
320	1184	2.145E-14	1.072E-04	56.2	19.71	1.848E 08	1.447E 07	4.536E 08	2.803E 06	1.021E 04
340	1193	1.459E-14	7.564E-05	58.6	19.14	1.110E 08	8.092E 06	3.378E 08	2.589E 06	9.956E 03
360	1199	1.011E-14	5.414E-05	60.9	18.62	6.721E 07	4.567E 06	2.529E 08	2.398E 06	9.729E 03
380	1204	7.119E-15	3.921E-05	63.1	18.17	4.097E 07	2.596E 06	1.903E 08	2.226E 06	9.522E 03
400	1207	5.081E-15	2.870E-05	65.1	17.77	2.511E 07	1.485E 06	1.436E 08	2.070E 06	9.332E 03
420	1209	3.670E-15	2.120E-05	66.9	17.41	1.546E 07	8.539E 05	1.087E 08	1.927E 06	9.153E 03
440	1211	2.679E-15	1.578E-05	68.7	17.09	9.564E 06	4.934E 05	8.256E 07	1.797E 06	8.984E 03
460	1213	1.973E-15	1.183E-05	70.3	16.81	5.937E 06	2.863E 05	6.282E 07	1.676E 06	8.822E 03
480	1213	1.465E-15	8.932E-06	71.9	16.55	3.698E 06	1.668E 05	4.790E 07	1.565E 06	8.667E 03
500	1214	1.096E-15	6.783E-06	73.4	16.31	2.311E 06	9.750E 04	3.660E 07	1.462E 06	8.517E 03
520	1215	8.247E-16	5.179E-06	74.9	16.08	1.449E 06	5.721E 04	2.801E 07	1.366E 06	8.371E 03
540	1215	6.241E-16	3.977E-06	76.5	15.86	9.111E 05	3.368E 04	2.148E 07	1.278E 06	8.230E 03
560	1216	4.746E-16	3.070E-06	78.1	15.63	5.746E 05	1.990E 04	1.650E 07	1.196E 06	8.092E 03
580	1216	3.626E-16	2.382E-06	79.7	15.39	3.634E 05	1.179E 04	1.269E 07	1.119E 06	7.958E 03
600	1216	2.783E-16	1.859E-06	81.6	15.14	2.305E 05	7.010E 03	9.781E 06	1.048E 06	7.827E 03
620	1217	2.144E-16	1.459E-06	83.5	14.87	1.466E 05	4.181E 03	7.549E 06	9.820E 05	7.699E 03
640	1217	1.659E-16	1.152E-06	85.8	14.57	9.345E 04	2.501E 03	5.835E 06	9.204E 05	7.575E 03
660	1217	1.288E-16	9.152E-07	88.2	14.24	5.974E 04	1.501E 03	4.517E 06	8.630E 05	7.453E 03
680	1217	1.004E-16	7.321E-07	91.1	13.88	3.830E 04	9.031E 02	3.503E 06	8.095E 05	7.334E 03
700	1217	7.860E-17	5.899E-07	94.3	13.49	2.461E 04	5.451E 02	2.720E 06	7.596E 05	7.217E 03
720	1217	6.179E-17	4.790E-07	97.9	13.06	1.586E 04	3.300E 02	2.115E 06	7.130E 05	7.103E 03

740	1218	4.878E-17	3.922E-07	102.1	12.59	1.024E 04	2.003E 02	1.647E 06	6.696E 05	6.992E 03
760	1218	3.870E-17	3.239E-07	106.9	12.10	6.634E 03	1.220E 02	1.285E 06	6.290E 05	6.883E 03
780	1218	3.085E-17	2.698E-07	112.4	11.58	4.307E 03	7.448E 01	1.003E 06	5.911E 05	6.776E 03
800	1218	2.473E-17	2.269E-07	118.5	11.04	2.803E 03	4.560E 01	7.846E 05	5.557E 05	6.672E 03
820	1218	1.993E-17	1.925E-07	125.5	10.48	1.828E 03	2.800E 01	6.145E 05	5.226E 05	6.570E 03
840	1218	1.617E-17	1.649E-07	133.3	9.93	1.196E 03	1.724E 01	4.819E 05	4.916E 05	6.470E 03
860	1218	1.321E-17	1.426E-07	141.9	9.38	7.837E 02	1.064E 01	3.785E 05	4.627E 05	6.373E 03
880	1218	1.086E-17	1.244E-07	151.3	8.84	5.149E 02	6.588E 00	2.976E 05	4.356E 05	6.277E 03
900	1218	9.001E-18	1.095E-07	161.5	8.33	3.391E 02	4.089E 00	2.344E 05	4.102E 05	6.183E 03
920	1218	7.518E-18	9.710E-08	172.5	7.84	2.239E 02	2.545E 00	1.848E 05	3.864E 05	6.092E 03
940	1218	6.331E-18	8.679E-08	184.1	7.39	1.481E 02	1.588E 00	1.459E 05	3.641E 05	6.002E 03
960	1218	5.376E-18	7.812E-08	196.2	6.97	9.821E 01	9.932E-01	1.154E 05	3.433E 05	5.914E 03
980	1218	4.604E-18	7.077E-08	208.7	6.59	6.527E 01	6.229E-01	9.131E 04	3.237E 05	5.828E 03
1000	1218	3.977E-18	6.448E-08	221.3	6.25	4.348E 01	3.916E-01	7.237E 04	3.053E 05	5.743E 03
1050	1218	2.858E-18	5.221E-08	252.7	5.55	1.589E 01	1.241E-01	4.070E 04	2.643E 05	5.539E 03
1100	1218	2.153E-18	4.330E-08	282.0	5.04	5.890E 00	3.995E-02	2.307E 04	2.291E 05	5.345E 03
1150	1218	1.689E-18	3.655E-08	307.6	4.68	2.211E 00	1.305E-02	1.317E 04	1.990E 05	5.160E 03
1200	1218	1.367E-18	3.124E-08	329.1	4.43	8.411E-01	4.328E-03	7.576E 03	1.732E 05	4.984E 03
1250	1218	1.134E-18	2.694E-08	346.7	4.26	3.240E-01	1.456E-03	4.390E 03	1.511E 05	4.817E 03
1300	1218	9.573E-19	2.340E-08	361.3	4.14	1.264E-01	4.969E-04	2.562E 03	1.319E 05	4.656E 03
1350	1218	8.188E-19	2.042E-08	373.5	4.06	4.989E-02	1.719E-04	1.505E 03	1.155E 05	4.504E 03
1400	1218	7.070E-19	1.790E-08	384.1	4.00	1.994E-02	6.031E-05	8.908E 02	1.012E 05	4.358E 03
1450	1218	6.147E-19	1.574E-08	393.4	3.96	8.060E-03	2.144E-05	5.306E 02	8.885E 04	4.218E 03
1500	1218	5.373E-19	1.388E-08	402.1	3.92	3.296E-03	7.724E-06	3.181E 02	7.814E 04	4.085E 03
1550	1218	4.715E-19	1.227E-08	410.2	3.89	1.363E-03	2.818E-06	1.920E 02	6.884E 04	3.957E 03
1600	1218	4.152E-19	1.088E-08	418.1	3.87	5.701E-04	1.041E-06	1.166E 02	6.073E 04	3.835E 03
1650	1218	3.666E-19	9.660E-09	425.9	3.84	2.410E-04	3.897E-07	7.126E 01	5.367E 04	3.719E 03
1700	1218	3.245E-19	8.600E-09	433.7	3.82	1.030E-04	1.476E-07	4.381E 01	4.750E 04	3.607E 03
1750	1218	2.878E-19	7.671E-09	441.7	3.80	4.448E-05	5.657E-08	2.710E 01	4.210E 04	3.500E 03
1800	1218	2.558E-19	6.857E-09	449.7	3.78	1.940E-05	2.194E-08	1.686E 01	3.737E 04	3.397E 03
1850	1218	2.277E-19	6.142E-09	458.0	3.76	8.551E-06	8.607E-09	1.055E 01	3.322E 04	3.298E 03
1900	1218	2.031E-19	5.512E-09	466.5	3.73	3.806E-06	3.415E-09	6.641E 00	2.957E 04	3.204E 03
1950	1218	1.814E-19	4.957E-09	475.3	3.71	1.711E-06	1.370E-09	4.203E 00	2.636E 04	3.113E 03
2000	1218	1.623E-19	4.466E-09	484.3	3.68	7.762E-07	5.557E-10	2.674E 00	2.355E 04	3.026E 03
2050	1218	1.455E-19	4.032E-09	493.7	3.66	3.555E-07	2.278E-10	1.711E 00	2.104E 04	2.942E 03

TIME (IN HOURS)= 7.000, COS(TH)= -2.5882E-01, INT GRAD= 1.6659E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	506	1.187E-11	1.850E-02	16.6	26.98	1.940E 11	3.612E 10	3.490E 10	1.577E 07	2.977E 04
140	625	5.531E-12	1.083E-02	20.9	26.54	8.962E 10	1.541E 10	2.050E 10	1.178E 07	2.361E 04
150	721	3.037E-12	6.968E-03	24.5	26.13	4.861E 10	7.823E 09	1.359E 10	9.545E 06	2.013E 04
160	800	1.837E-12	4.751E-03	27.7	25.72	2.896E 10	4.395E 09	9.666E 09	8.106E 06	1.787E 04
170	867	1.184E-12	3.371E-03	30.6	25.32	1.834E 10	2.638E 09	7.192E 09	7.087E 06	1.627E 04
180	925	7.989E-13	2.464E-03	33.3	24.92	1.213E 10	1.660E 09	5.521E 09	6.318E 06	1.506E 04
190	976	5.576E-13	1.844E-03	35.8	24.52	8.276E 09	1.081E 09	4.336E 09	5.712E 06	1.411E 04
200	1021	4.000E-13	1.407E-03	38.2	24.13	5.792E 09	7.240E 08	3.468E 09	5.220E 06	1.333E 04
220	1097	2.196E-13	8.577E-04	42.6	23.35	3.005E 09	3.457E 08	2.310E 09	4.467E 06	1.215E 04
240	1156	1.288E-13	5.482E-04	46.7	22.59	1.652E 09	1.759E 08	1.604E 09	3.918E 06	1.131E 04
260	1201	7.952E-14	3.632E-04	50.5	21.87	9.463E 08	9.361E 07	1.147E 09	3.501E 06	1.068E 04
280	1235	5.107E-14	2.475E-04	53.9	21.18	5.589E 08	5.151E 07	8.391E 08	3.170E 06	1.021E 04
300	1260	3.384E-14	1.726E-04	57.0	20.53	3.375E 08	2.904E 07	6.235E 08	2.899E 06	9.833E 03
320	1278	2.301E-14	1.226E-04	59.9	19.94	2.072E 08	1.667E 07	4.688E 08	2.670E 06	9.531E 03
340	1291	1.598E-14	8.846E-05	62.6	19.39	1.288E 08	9.702E 06	3.557E 08	2.472E 06	9.278E 03
360	1300	1.131E-14	6.468E-05	65.1	18.89	8.088E 07	5.707E 06	2.717E 08	2.298E 06	9.060E 03
380	1307	8.121E-15	4.784E-05	67.5	18.44	5.116E 07	3.385E 06	2.086E 08	2.142E 06	8.867E 03
400	1312	5.912E-15	3.573E-05	69.6	18.04	3.256E 07	2.021E 06	1.608E 08	2.001E 06	8.693E 03
420	1315	4.354E-15	2.692E-05	71.6	17.69	2.083E 07	1.214E 06	1.244E 08	1.872E 06	8.532E 03
440	1318	3.239E-15	2.044E-05	73.5	17.37	1.338E 07	7.327E 05	9.649E 07	1.754E 06	8.381E 03
460	1320	2.432E-15	1.562E-05	75.3	17.08	8.630E 06	4.442E 05	7.503E 07	1.645E 06	8.238E 03
480	1321	1.840E-15	1.201E-05	77.0	16.83	5.586E 06	2.703E 05	5.847E 07	1.543E 06	8.102E 03
500	1323	1.402E-15	9.291E-06	78.6	16.59	3.627E 06	1.651E 05	4.566E 07	1.450E 06	7.971E 03
520	1323	1.074E-15	7.223E-06	80.2	16.37	2.362E 06	1.012E 05	3.572E 07	1.362E 06	7.845E 03
540	1324	8.280E-16	5.642E-06	81.8	16.16	1.543E 06	6.221E 04	2.799E 07	1.281E 06	7.722E 03
560	1325	6.413E-16	4.428E-06	83.3	15.95	1.010E 06	3.837E 04	2.196E 07	1.205E 06	7.603E 03
580	1325	4.990E-16	3.491E-06	84.9	15.74	6.635E 05	2.374E 04	1.727E 07	1.134E 06	7.486E 03
600	1325	3.898E-16	2.765E-06	86.6	15.53	4.368E 05	1.473E 04	1.359E 07	1.068E 06	7.373E 03
620	1326	3.057E-16	2.200E-06	88.4	15.31	2.883E 05	9.164E 03	1.072E 07	1.006E 06	7.262E 03
640	1326	2.406E-16	1.759E-06	90.3	15.08	1.908E 05	5.719E 03	8.460E 06	9.475E 05	7.154E 03
660	1326	1.900E-16	1.413E-06	92.3	14.83	1.265E 05	3.578E 03	6.689E 06	8.931E 05	7.048E 03
680	1326	1.505E-16	1.140E-06	94.6	14.55	8.412E 04	2.245E 03	5.296E 06	8.421E 05	6.945E 03
700	1326	1.197E-16	9.257E-07	97.2	14.26	5.606E 04	1.413E 03	4.199E 06	7.944E 05	6.843E 03
720	1327	9.547E-17	7.557E-07	100.0	13.93	3.745E 04	8.912E 02	3.335E 06	7.496E 05	6.744E 03

740	1327	7.642E-17	6.206E-07	103.2	13.58	2.508E 04	5.637E 02	2.650E 06	7.075E 05	6.647E 03
760	1327	6.138E-17	5.128E-07	106.7	13.20	1.683E 04	3.575E 02	2.109E 06	6.681E 05	6.552E 03
780	1327	4.948E-17	4.267E-07	110.8	12.79	1.132E 04	2.273E 02	1.681E 06	6.311E 05	6.459E 03
800	1327	4.004E-17	3.575E-07	115.3	12.36	7.632E 03	1.449E 02	1.342E 06	5.963E 05	6.368E 03
820	1327	3.254E-17	3.017E-07	120.5	11.90	5.157E 03	9.262E 01	1.072E 06	5.636E 05	6.278E 03
840	1327	2.655E-17	2.565E-07	126.2	11.42	3.492E 03	5.935E 01	8.577E 05	5.329E 05	6.191E 03
860	1327	2.177E-17	2.197E-07	132.6	10.93	2.370E 03	3.812E 01	6.871E 05	5.040E 05	6.105E 03
880	1327	1.793E-17	1.897E-07	139.7	10.43	1.612E 03	2.454E 01	5.511E 05	4.768E 05	6.021E 03
900	1327	1.485E-17	1.650E-07	147.6	9.93	1.099E 03	1.584E 01	4.426E 05	4.513E 05	5.938E 03
920	1327	1.237E-17	1.447E-07	156.2	9.43	7.504E 02	1.025E 01	3.559E 05	4.272E 05	5.857E 03
940	1327	1.036E-17	1.277E-07	165.6	8.95	5.136E 02	6.649E 00	2.865E 05	4.045E 05	5.778E 03
960	1327	8.728E-18	1.136E-07	175.7	8.48	3.523E 02	4.323E 00	2.309E 05	3.832E 05	5.700E 03
980	1327	7.403E-18	1.017E-07	186.6	8.03	2.421E 02	2.817E 00	1.863E 05	3.631E 05	5.624E 03
1000	1327	6.320E-18	9.167E-08	198.0	7.61	1.667E 02	1.840E 00	1.505E 05	3.442E 05	5.549E 03
1050	1327	4.386E-18	7.247E-08	228.6	6.68	6.622E 01	6.409E-01	8.875E 04	3.014E 05	5.368E 03
1100	1327	3.178E-18	5.905E-08	260.5	5.94	2.662E 01	2.264E-01	5.270E 04	2.644E 05	5.195E 03
1150	1327	2.399E-18	4.926E-08	291.8	5.38	1.083E 01	8.110E-02	3.151E 04	2.324E 05	5.030E 03
1200	1327	1.879E-18	4.184E-08	320.6	4.96	4.461E 00	2.945E-02	1.897E 04	2.046E 05	4.872E 03
1250	1327	1.519E-18	3.602E-08	346.0	4.65	1.859E 00	1.083E-02	1.149E 04	1.804E 05	4.721E 03
1300	1327	1.259E-18	3.131E-08	367.8	4.44	7.832E-01	4.039E-03	7.011E 03	1.593E 05	4.577E 03
1350	1327	1.064E-18	2.742E-08	386.2	4.28	3.338E-01	1.525E-03	4.304E 03	1.410E 05	4.439E 03
1400	1327	9.123E-19	2.416E-08	401.7	4.17	1.438E-01	5.830E-04	2.659E 03	1.249E 05	4.307E 03
1450	1327	7.914E-19	2.137E-08	415.0	4.09	6.263E-02	2.256E-04	1.653E 03	1.108E 05	4.180E 03
1500	1327	6.924E-19	1.898E-08	426.7	4.03	2.757E-02	8.839E-05	1.034E 03	9.852E 04	4.059E 03
1550	1327	6.097E-19	1.690E-08	437.1	3.98	1.226E-02	3.504E-05	6.502E 02	8.769E 04	3.942E 03
1600	1327	5.395E-19	1.510E-08	446.7	3.94	5.508E-03	1.405E-05	4.114E 02	7.817E 04	3.831E 03
1650	1327	4.793E-19	1.351E-08	455.7	3.91	2.499E-03	5.700E-06	2.618E 02	6.978E 04	3.724E 03
1700	1327	4.272E-19	1.212E-08	464.3	3.89	1.145E-03	2.338E-06	1.675E 02	6.238E 04	3.621E 03
1750	1327	3.818E-19	1.089E-08	472.8	3.87	5.299E-04	9.697E-07	1.078E 02	5.584E 04	3.522E 03
1800	1327	3.420E-19	9.810E-09	481.2	3.85	2.475E-04	4.065E-07	6.974E 01	5.006E 04	3.427E 03
1850	1327	3.069E-19	8.850E-09	489.6	3.83	1.167E-04	1.722E-07	4.535E 01	4.493E 04	3.335E 03
1900	1327	2.760E-19	7.998E-09	498.1	3.81	5.549E-05	7.372E-08	2.965E 01	4.038E 04	3.248E 03
1950	1327	2.486E-19	7.240E-09	506.7	3.79	2.664E-05	3.188E-08	1.948E 01	3.634E 04	3.163E 03
2000	1327	2.242E-19	6.565E-09	515.5	3.77	1.290E-05	1.393E-08	1.287E 01	3.275E 04	3.082E 03
2050	1327	2.026E-19	5.963E-09	524.4	3.75	6.298E-06	6.144E-09	8.540E 00	2.954E 04	3.004E 03

TIME (IN HOURS)= 8.000, COS(TH)= -5.0000E-01, INT GRAD= 1.6540E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	505	1.188E-11	1.848E-02	16.5	26.98	1.941E 11	3.615E 10	3.495E 10	1.580E 07	2.982E 04
140	625	5.527E-12	1.081E-02	20.8	26.54	8.954E 10	1.540E 10	2.049E 10	1.178E 07	2.362E 04
150	723	3.025E-12	6.960E-03	24.6	26.13	4.841E 10	7.789E 09	1.354E 10	9.515E 06	2.007E 04
160	808	1.822E-12	4.756E-03	28.0	25.73	2.872E 10	4.359E 09	9.579E 09	8.029E 06	1.770E 04
170	883	1.169E-12	3.391E-03	31.2	25.33	1.812E 10	2.609E 09	7.084E 09	6.961E 06	1.597E 04
180	952	7.870E-13	2.497E-03	34.2	24.94	1.196E 10	1.640E 09	5.409E 09	6.151E 06	1.464E 04
190	1014	5.496E-13	1.886E-03	37.1	24.56	8.172E 09	1.072E 09	4.235E 09	5.518E 06	1.359E 04
200	1069	3.957E-13	1.455E-03	39.9	24.18	5.747E 09	7.224E 08	3.385E 09	5.012E 06	1.275E 04
220	1162	2.203E-13	9.081E-04	45.0	23.44	3.037E 09	3.529E 08	2.268E 09	4.258E 06	1.150E 04
240	1233	1.319E-13	5.947E-04	49.5	22.73	1.713E 09	1.850E 08	1.594E 09	3.729E 06	1.064E 04
260	1286	8.324E-14	4.034E-04	53.5	22.05	1.011E 09	1.019E 08	1.158E 09	3.335E 06	1.003E 04
280	1324	5.465E-14	2.811E-04	57.2	21.41	6.160E 08	5.813E 07	8.609E 08	3.028E 06	9.573E 03
300	1353	3.700E-14	2.001E-04	60.5	20.80	3.840E 08	3.399E 07	6.511E 08	2.778E 06	9.223E 03
320	1373	2.567E-14	1.449E-04	63.5	20.22	2.434E 08	2.024E 07	4.985E 08	2.569E 06	8.943E 03
340	1388	1.817E-14	1.065E-04	66.3	19.70	1.563E 08	1.222E 07	3.850E 08	2.389E 06	8.711E 03
360	1398	1.308E-14	7.919E-05	68.9	19.21	1.013E 08	7.453E 06	2.994E 08	2.230E 06	8.514E 03
380	1406	9.557E-15	5.954E-05	71.3	18.77	6.611E 07	4.583E 06	2.341E 08	2.087E 06	8.340E 03
400	1412	7.069E-15	4.518E-05	73.6	18.36	4.342E 07	2.837E 06	1.837E 08	1.958E 06	8.184E 03
420	1416	5.287E-15	3.457E-05	75.8	18.00	2.866E 07	1.766E 06	1.447E 08	1.840E 06	8.040E 03
440	1419	3.992E-15	2.664E-05	77.8	17.68	1.899E 07	1.105E 06	1.142E 08	1.732E 06	7.906E 03
460	1421	3.040E-15	2.066E-05	79.7	17.38	1.264E 07	6.937E 05	9.042E 07	1.631E 06	7.780E 03
480	1423	2.333E-15	1.612E-05	81.5	17.12	8.434E 06	4.372E 05	7.172E 07	1.537E 06	7.659E 03
500	1424	1.803E-15	1.265E-05	83.2	16.87	5.646E 06	2.766E 05	5.699E 07	1.450E 06	7.543E 03
520	1425	1.401E-15	9.968E-06	84.9	16.65	3.791E 06	1.755E 05	4.536E 07	1.369E 06	7.431E 03
540	1425	1.095E-15	7.893E-06	86.5	16.44	2.552E 06	1.117E 05	3.616E 07	1.293E 06	7.323E 03
560	1426	8.601E-16	6.277E-06	88.1	16.25	1.722E 06	7.129E 04	2.887E 07	1.221E 06	7.217E 03
580	1426	6.785E-16	5.012E-06	89.7	16.06	1.165E 06	4.563E 04	2.309E 07	1.154E 06	7.115E 03
600	1427	5.374E-16	4.018E-06	91.3	15.87	7.903E 05	2.929E 04	1.849E 07	1.091E 06	7.014E 03
620	1427	4.272E-16	3.233E-06	92.9	15.68	5.372E 05	1.885E 04	1.482E 07	1.032E 06	6.916E 03
640	1427	3.408E-16	2.613E-06	94.7	15.48	3.661E 05	1.216E 04	1.190E 07	9.768E 05	6.820E 03
660	1428	2.727E-16	2.119E-06	96.5	15.28	2.500E 05	7.870E 03	9.568E 06	9.246E 05	6.727E 03
680	1428	2.190E-16	1.726E-06	98.5	15.06	1.711E 05	5.105E 03	7.702E 06	8.754E 05	6.635E 03
700	1428	1.763E-16	1.412E-06	100.6	14.83	1.174E 05	3.319E 03	6.208E 06	8.292E 05	6.545E 03
720	1428	1.424E-16	1.160E-06	102.9	14.58	8.070E 04	2.164E 03	5.010E 06	7.857E 05	6.457E 03

740	1428	1.153E-16	9.572E-07	105.4	14.31	5.560E 04	1.414E 03	4.048E 06	7.447E 05	6.370E 03
760	1428	9.368E-17	7.938E-07	108.3	14.02	3.839E 04	9.264E 02	3.275E 06	7.060E 05	6.285E 03
780	1429	7.632E-17	6.616E-07	111.4	13.70	2.656E 04	6.083E 02	2.653E 06	6.696E 05	6.202E 03
800	1429	6.236E-17	5.543E-07	114.8	13.36	1.842E 04	4.004E 02	2.151E 06	6.352E 05	6.121E 03
820	1429	5.111E-17	4.670E-07	118.7	13.00	1.280E 04	2.642E 02	1.747E 06	6.028E 05	6.041E 03
840	1429	4.203E-17	3.958E-07	123.0	12.61	8.908E 03	1.747E 02	1.420E 06	5.723E 05	5.963E 03
860	1429	3.467E-17	3.374E-07	127.8	12.21	6.215E 03	1.158E 02	1.156E 06	5.434E 05	5.886E 03
880	1429	2.871E-17	2.895E-07	133.2	11.78	4.344E 03	7.695E 01	9.416E 05	5.161E 05	5.810E 03
900	1429	2.386E-17	2.499E-07	139.1	11.34	3.043E 03	5.124E 01	7.680E 05	4.904E 05	5.736E 03
920	1429	1.991E-17	2.171E-07	145.7	10.89	2.135E 03	3.420E 01	6.272E 05	4.660E 05	5.664E 03
940	1429	1.668E-17	1.899E-07	152.9	10.44	1.502E 03	2.288E 01	5.128E 05	4.430E 05	5.592E 03
960	1429	1.404E-17	1.671E-07	160.8	9.98	1.058E 03	1.533E 01	4.197E 05	4.213E 05	5.522E 03
980	1429	1.187E-17	1.481E-07	169.4	9.52	7.468E 02	1.030E 01	3.439E 05	4.007E 05	5.454E 03
1000	1429	1.008E-17	1.320E-07	178.7	9.08	5.281E 02	6.937E 00	2.820E 05	3.813E 05	5.386E 03
1050	1429	6.864E-18	1.016E-07	204.8	8.03	2.240E 02	2.604E 00	1.727E 05	3.371E 05	5.223E 03
1100	1429	4.837E-18	8.087E-08	234.4	7.11	9.607E 01	9.907E-01	1.064E 05	2.985E 05	5.067E 03
1150	1429	3.534E-18	6.620E-08	266.2	6.34	4.168E 01	3.818E-01	6.599E 04	2.647E 05	4.917E 03
1200	1429	2.675E-18	5.545E-08	298.5	5.73	1.828E 01	1.490E-01	4.118E 04	2.352E 05	4.773E 03
1250	1429	2.094E-18	4.728E-08	329.5	5.26	8.106E 00	5.885E-02	2.586E 04	2.093E 05	4.636E 03
1300	1429	1.688E-18	4.088E-08	358.1	4.91	3.633E 00	2.353E-02	1.634E 04	1.865E 05	4.504E 03
1350	1429	1.395E-18	3.573E-08	383.5	4.64	1.645E 00	9.523E-03	1.039E 04	1.664E 05	4.378E 03
1400	1429	1.177E-18	3.148E-08	405.7	4.44	7.525E-01	3.899E-03	6.639E 03	1.487E 05	4.257E 03
1450	1429	1.010E-18	2.791E-08	424.8	4.30	3.477E-01	1.614E-03	4.269E 03	1.331E 05	4.140E 03
1500	1429	8.771E-19	2.487E-08	441.3	4.19	1.622E-01	6.760E-04	2.760E 03	1.193E 05	4.028E 03
1550	1429	7.695E-19	2.224E-08	455.6	4.11	7.643E-02	2.862E-04	1.795E 03	1.071E 05	3.921E 03
1600	1429	6.804E-19	1.996E-08	468.3	4.05	3.635E-02	1.225E-04	1.173E 03	9.623E 04	3.818E 03
1650	1429	6.052E-19	1.796E-08	479.8	4.00	1.745E-02	5.298E-05	7.709E 02	8.660E 04	3.718E 03
1700	1429	5.409E-19	1.620E-08	490.3	3.97	8.451E-03	2.315E-05	5.092E 02	7.804E 04	3.623E 03
1750	1429	4.852E-19	1.465E-08	500.2	3.94	4.131E-03	1.022E-05	3.381E 02	7.041E 04	3.531E 03
1800	1429	4.367E-19	1.327E-08	509.7	3.91	2.037E-03	4.559E-06	2.256E 02	6.361E 04	3.442E 03
1850	1429	3.940E-19	1.204E-08	518.9	3.89	1.013E-03	2.053E-06	1.513E 02	5.754E 04	3.357E 03
1900	1429	3.562E-19	1.094E-08	527.9	3.87	5.079E-04	9.337E-07	1.019E 02	5.211E 04	3.275E 03
1950	1429	3.228E-19	9.961E-09	536.9	3.85	2.569E-04	4.286E-07	6.902E 01	4.724E 04	3.196E 03
2000	1429	2.929E-19	9.082E-09	545.8	3.83	1.310E-04	1.986E-07	4.695E 01	4.289E 04	3.119E 03
2050	1429	2.663E-19	8.293E-09	554.9	3.82	6.730E-05	9.286E-08	3.208E 01	3.897E 04	3.046E 03

TIME (IN HOURS)= 9.000, COS(TH)= -7.0711E-01, INT GRAD= 1.6432E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(02) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	504	1.188E-11	1.847E-02	16.5	26.98	1.942E 11	3.617E 10	3.498E 10	1.582E 07	2.985E 04
140	626	5.514E-12	1.081E-02	20.9	26.54	8.933E 10	1.536E 10	2.045E 10	1.176E 07	2.359E 04
150	730	3.002E-12	6.970E-03	24.8	26.13	4.804E 10	7.731E 09	1.343E 10	9.451E 06	1.989E 04
160	824	1.799E-12	4.788E-03	28.5	25.73	2.837E 10	4.310E 09	9.433E 09	7.881E 06	1.736E 04
170	910	1.153E-12	3.442E-03	32.1	25.35	1.787E 10	2.579E 09	6.939E 09	6.771E 06	1.551E 04
180	989	7.773E-13	2.560E-03	35.5	24.97	1.183E 10	1.629E 09	5.288E 09	5.942E 06	1.410E 04
190	1060	5.457E-13	1.955E-03	38.8	24.61	8.139E 09	1.073E 09	4.145E 09	5.306E 06	1.301E 04
200	1124	3.959E-13	1.525E-03	41.8	24.25	5.777E 09	7.318E 08	3.323E 09	4.807E 06	1.216E 04
220	1228	2.247E-13	9.737E-04	47.3	23.56	3.124E 09	3.673E 08	2.251E 09	4.079E 06	1.092E 04
240	1306	1.373E-13	6.512E-04	52.1	22.89	1.808E 09	1.984E 08	1.603E 09	3.577E 06	1.009E 04
260	1364	8.835E-14	4.502E-04	56.3	22.25	1.095E 09	1.126E 08	1.182E 09	3.207E 06	9.501E 03
280	1406	5.910E-14	3.193E-04	60.0	21.64	6.849E 08	6.617E 07	8.916E 08	2.921E 06	9.072E 03
300	1437	4.071E-14	2.309E-04	63.4	21.05	4.381E 08	3.985E 07	6.842E 08	2.689E 06	8.743E 03
320	1459	2.870E-14	1.698E-04	66.5	20.50	2.849E 08	2.443E 07	5.314E 08	2.495E 06	8.483E 03
340	1475	2.062E-14	1.265E-04	69.4	19.99	1.876E 08	1.518E 07	4.164E 08	2.327E 06	8.269E 03
360	1486	1.505E-14	9.535E-05	72.1	19.51	1.246E 08	9.529E 06	3.285E 08	2.180E 06	8.087E 03
380	1495	1.114E-14	7.260E-05	74.6	19.07	8.340E 07	6.029E 06	2.604E 08	2.048E 06	7.928E 03
400	1501	8.341E-15	5.577E-05	77.0	18.67	5.614E 07	3.839E 06	2.073E 08	1.928E 06	7.785E 03
420	1506	6.312E-15	4.317E-05	79.3	18.30	3.797E 07	2.457E 06	1.655E 08	1.818E 06	7.654E 03
440	1509	4.820E-15	3.366E-05	81.4	17.97	2.579E 07	1.580E 06	1.325E 08	1.716E 06	7.533E 03
460	1511	3.712E-15	2.640E-05	83.4	17.66	1.758E 07	1.020E 06	1.064E 08	1.622E 06	7.418E 03
480	1513	2.879E-15	2.083E-05	85.3	17.39	1.202E 07	6.609E 05	8.553E 07	1.534E 06	7.309E 03
500	1515	2.248E-15	1.652E-05	87.1	17.14	8.240E 06	4.296E 05	6.890E 07	1.452E 06	7.204E 03
520	1516	1.766E-15	1.316E-05	88.9	16.91	5.665E 06	2.801E 05	5.559E 07	1.375E 06	7.103E 03
540	1516	1.395E-15	1.053E-05	90.6	16.70	3.905E 06	1.832E 05	4.492E 07	1.303E 06	7.005E 03
560	1517	1.107E-15	8.461E-06	92.2	16.50	2.698E 06	1.201E 05	3.635E 07	1.235E 06	6.910E 03
580	1518	8.826E-16	6.824E-06	93.9	16.32	1.869E 06	7.896E 04	2.946E 07	1.171E 06	6.817E 03
600	1518	7.064E-16	5.525E-06	95.5	16.14	1.297E 06	5.205E 04	2.391E 07	1.111E 06	6.726E 03
620	1518	5.675E-16	4.489E-06	97.1	15.96	9.026E 05	3.440E 04	1.942E 07	1.055E 06	6.638E 03
640	1519	4.575E-16	3.660E-06	98.8	15.79	6.294E 05	2.279E 04	1.580E 07	1.001E 06	6.551E 03
660	1519	3.700E-16	2.994E-06	100.5	15.61	4.398E 05	1.513E 04	1.287E 07	9.509E 05	6.466E 03
680	1519	3.001E-16	2.458E-06	102.3	15.42	3.080E 05	1.007E 04	1.050E 07	9.033E 05	6.383E 03
700	1519	2.441E-16	2.025E-06	104.2	15.23	2.161E 05	6.723E 03	8.571E 06	8.584E 05	6.302E 03
720	1520	1.991E-16	1.675E-06	106.2	15.03	1.519E 05	4.496E 03	7.007E 06	8.160E 05	6.222E 03

740	1520	1.629E-16	1.390E-06	108.4	14.81	1.071E 05	3.015E 03	5.735E 06	7.759E 05	6.143E 03
760	1520	1.336E-16	1.158E-06	110.8	14.58	7.558E 04	2.026E 03	4.699E 06	7.380E 05	6.067E 03
780	1520	1.098E-16	9.685E-07	113.3	14.33	5.346E 04	1.364E 03	3.855E 06	7.021E 05	5.991E 03
800	1520	9.049E-17	8.136E-07	116.2	14.06	3.789E 04	9.208E 02	3.166E 06	6.682E 05	5.917E 03
820	1520	7.477E-17	6.864E-07	119.3	13.77	2.691E 04	6.229E 02	2.603E 06	6.361E 05	5.844E 03
840	1520	6.195E-17	5.818E-07	122.7	13.46	1.915E 04	4.224E 02	2.142E 06	6.057E 05	5.773E 03
860	1520	5.147E-17	4.955E-07	126.5	13.13	1.365E 04	2.870E 02	1.765E 06	5.770E 05	5.705E 03
880	1520	4.287E-17	4.241E-07	130.7	12.78	9.750E 03	1.954E 02	1.456E 06	5.497E 05	5.634E 03
900	1520	3.582E-17	3.648E-07	135.3	12.41	6.977E 03	1.333E 02	1.202E 06	5.239E 05	5.567E 03
920	1520	3.002E-17	3.155E-07	140.4	12.03	5.002E 03	9.118E 01	9.938E 05	4.994E 05	5.501E 03
940	1520	2.524E-17	2.744E-07	146.0	11.63	3.592E 03	6.248E 01	8.224E 05	4.762E 05	5.436E 03
960	1521	2.129E-17	2.399E-07	152.2	11.22	2.585E 03	4.291E 01	6.813E 05	4.542E 05	5.372E 03
980	1521	1.802E-17	2.110E-07	159.0	10.80	1.863E 03	2.952E 01	5.649E 05	4.333E 05	5.309E 03
1000	1521	1.531E-17	1.866E-07	166.4	10.37	1.345E 03	2.036E 01	4.689E 05	4.135E 05	5.247E 03
1050	1521	1.036E-17	1.405E-07	187.6	9.32	6.007E 02	8.107E 00	2.957E 05	3.683E 05	5.097E 03
1100	1521	7.205E-18	1.094E-07	212.9	8.33	2.712E 02	3.269E 00	1.876E 05	3.285E 05	4.954E 03
1150	1521	5.159E-18	8.775E-08	241.7	7.43	1.237E 02	1.334E 00	1.197E 05	2.935E 05	4.816E 03
1200	1521	3.809E-18	7.223E-08	273.0	6.67	5.701E 01	5.508E-01	7.687E 04	2.626E 05	4.684E 03
1250	1521	2.901E-18	6.075E-08	305.6	6.04	2.655E 01	2.301E-01	4.964E 04	2.353E 05	4.557E 03
1300	1521	2.276E-18	5.200E-08	337.8	5.53	1.248E 01	9.722E-02	3.224E 04	2.111E 05	4.435E 03
1350	1521	1.835E-18	4.513E-08	368.4	5.14	5.929E 00	4.154E-02	2.106E 04	1.897E 05	4.318E 03
1400	1521	1.515E-18	3.960E-08	396.5	4.84	2.843E 00	1.794E-02	1.383E 04	1.707E 05	4.206E 03
1450	1521	1.277E-18	3.505E-08	421.7	4.61	1.376E 00	7.835E-03	9.132E 03	1.538E 05	4.098E 03
1500	1521	1.095E-18	3.123E-08	443.9	4.43	6.721E-01	3.457E-03	6.061E 03	1.388E 05	3.993E 03
1550	1521	9.514E-19	2.797E-08	463.4	4.30	3.313E-01	1.541E-03	4.044E 03	1.254E 05	3.893E 03
1600	1521	8.359E-19	2.516E-08	480.4	4.20	1.648E-01	6.942E-04	2.712E 03	1.134E 05	3.797E 03
1650	1521	7.407E-19	2.271E-08	495.5	4.12	8.266E-02	3.158E-04	1.828E 03	1.027E 05	3.704E 03
1700	1521	6.610E-19	2.056E-08	509.0	4.06	4.183E-02	1.451E-04	1.238E 03	9.311E 04	3.614E 03
1750	1521	5.930E-19	1.865E-08	521.3	4.02	2.134E-02	6.727E-05	8.424E 02	8.453E 04	3.528E 03
1800	1521	5.343E-19	1.697E-08	532.6	3.98	1.098E-02	3.149E-05	5.759E 02	7.684E 04	3.445E 03
1850	1521	4.832E-19	1.546E-08	543.3	3.95	5.694E-03	1.488E-05	3.956E 02	6.992E 04	3.365E 03
1900	1521	4.383E-19	1.411E-08	553.5	3.93	2.977E-03	7.095E-06	2.730E 02	6.370E 04	3.287E 03
1950	1521	3.985E-19	1.290E-08	563.3	3.90	1.568E-03	3.413E-06	1.892E 02	5.810E 04	3.212E 03
2000	1521	3.631E-19	1.182E-08	573.0	3.88	8.326E-04	1.656E-06	1.317E 02	5.305E 04	3.140E 03
2050	1521	3.315E-19	1.084E-08	582.5	3.87	4.454E-04	8.107E-07	9.209E 01	4.849E 04	3.070E 03

TIME (IN HOURS)= 10.000, COS(TH)= -8.6602E-01, INT GRAD= 1.6338E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	504	1.188E-11	1.846E-02	16.5	26.98	1.942E 11	3.616E 10	3.498E 10	1.582E 07	2.986E 04
140	629	5.489E-12	1.081E-02	21.0	26.54	8.893E 10	1.529E 10	2.036E 10	1.170E 07	2.347E 04
150	741	2.972E-12	7.003E-03	25.2	26.13	4.757E 10	7.660E 09	1.327E 10	9.297E 06	1.959E 04
160	845	1.776E-12	4.847E-03	29.2	25.75	2.803E 10	4.266E 09	9.266E 09	7.699E 06	1.693E 04
170	941	1.140E-12	3.516E-03	33.2	25.37	1.770E 10	2.563E 09	6.803E 09	6.571E 06	1.501E 04
180	1029	7.728E-13	2.642E-03	36.9	25.01	1.179E 10	1.631E 09	5.190E 09	5.744E 06	1.358E 04
190	1107	5.467E-13	2.039E-03	40.3	24.66	8.180E 09	1.086E 09	4.082E 09	5.120E 06	1.249E 04
200	1175	4.000E-13	1.607E-03	43.6	24.33	5.865E 09	7.492E 08	3.288E 09	4.635E 06	1.165E 04
220	1287	2.311E-13	1.045E-03	49.3	23.67	3.240E 09	3.855E 08	2.253E 09	3.938E 06	1.044E 04
240	1370	1.436E-13	7.105E-04	54.3	23.04	1.916E 09	2.134E 08	1.624E 09	3.461E 06	9.647E 03
260	1432	9.395E-14	4.987E-04	58.6	22.43	1.186E 09	1.241E 08	1.211E 09	3.111E 06	9.091E 03
280	1476	6.378E-14	3.584E-04	62.5	21.84	7.569E 08	7.469E 07	9.245E 08	2.841E 06	8.684E 03
300	1509	4.453E-14	2.625E-04	65.9	21.28	4.941E 08	4.603E 07	7.176E 08	2.623E 06	8.374E 03
320	1533	3.178E-14	1.952E-04	69.1	20.75	3.277E 08	2.887E 07	5.637E 08	2.440E 06	8.129E 03
340	1550	2.310E-14	1.470E-04	72.0	20.25	2.200E 08	1.834E 07	4.466E 08	2.282E 06	7.928E 03
360	1562	1.704E-14	1.119E-04	74.7	19.78	1.490E 08	1.177E 07	3.562E 08	2.143E 06	7.758E 03
380	1571	1.274E-14	8.603E-05	77.3	19.34	1.016E 08	7.610E 06	2.855E 08	2.019E 06	7.609E 03
400	1578	9.628E-15	6.670E-05	79.8	18.94	6.973E 07	4.952E 06	2.297E 08	1.905E 06	7.476E 03
420	1583	7.350E-15	5.210E-05	82.1	18.57	4.806E 07	3.239E 06	1.854E 08	1.801E 06	7.355E 03
440	1587	5.662E-15	4.097E-05	84.3	18.23	3.326E 07	2.128E 06	1.500E 08	1.705E 06	7.242E 03
460	1589	4.396E-15	3.242E-05	86.5	17.92	2.309E 07	1.403E 06	1.217E 08	1.616E 06	7.136E 03
480	1591	3.438E-15	2.579E-05	88.5	17.64	1.608E 07	9.286E 05	9.889E 07	1.532E 06	7.035E 03
500	1593	2.706E-15	2.062E-05	90.4	17.38	1.123E 07	6.165E 05	8.050E 07	1.454E 06	6.938E 03
520	1594	2.143E-15	1.657E-05	92.2	17.14	7.867E 06	4.105E 05	6.564E 07	1.381E 06	6.845E 03
540	1595	1.706E-15	1.337E-05	94.0	16.93	5.523E 06	2.741E 05	5.360E 07	1.312E 06	6.755E 03
560	1596	1.365E-15	1.083E-05	95.7	16.73	3.886E 06	1.835E 05	4.383E 07	1.246E 06	6.667E 03
580	1597	1.097E-15	8.801E-06	97.4	16.54	2.741E 06	1.232E 05	3.589E 07	1.185E 06	6.581E 03
600	1597	8.847E-16	7.180E-06	99.1	16.36	1.937E 06	8.287E 04	2.942E 07	1.127E 06	6.498E 03
620	1597	7.164E-16	5.877E-06	100.7	16.19	1.372E 06	5.590E 04	2.415E 07	1.072E 06	6.416E 03
640	1598	5.821E-16	4.827E-06	102.4	16.02	9.741E 05	3.779E 04	1.985E 07	1.021E 06	6.336E 03
660	1598	4.746E-16	3.976E-06	104.1	15.86	6.928E 05	2.561E 04	1.633E 07	9.718E 05	6.258E 03
680	1598	3.880E-16	3.286E-06	105.8	15.69	4.938E 05	1.740E 04	1.346E 07	9.255E 05	6.182E 03
700	1599	3.181E-16	2.725E-06	107.6	15.52	3.526E 05	1.184E 04	1.110E 07	8.817E 05	6.107E 03
720	1599	2.615E-16	2.266E-06	109.5	15.34	2.523E 05	8.082E 03	9.163E 06	8.402E 05	6.033E 03

740	1599	2.155E-16	1.891E-06	111.4	15.16	1.809E 05	5.527E 03	7.574E 06	8.009E 05	5.961E 03
760	1599	1.781E-16	1.583E-06	113.5	14.96	1.299E 05	3.788E 03	6.268E 06	7.637E 05	5.890E 03
780	1599	1.475E-16	1.329E-06	115.8	14.75	9.350E 04	2.601E 03	5.192E 06	7.284E 05	5.820E 03
800	1599	1.224E-16	1.120E-06	118.2	14.53	6.741E 04	1.791E 03	4.306E 06	6.949E 05	5.751E 03
820	1600	1.019E-16	9.478E-07	120.9	14.29	4.869E 04	1.235E 03	3.575E 06	6.631E 05	5.684E 03
840	1600	8.495E-17	8.048E-07	123.8	14.04	3.524E 04	8.536E 02	2.971E 06	6.330E 05	5.618E 03
860	1600	7.101E-17	6.860E-07	126.9	13.77	2.554E 04	5.912E 02	2.472E 06	6.044E 05	5.554E 03
880	1600	5.950E-17	5.872E-07	130.4	13.48	1.855E 04	4.103E 02	2.058E 06	5.772E 05	5.490E 03
900	1600	4.998E-17	5.048E-07	134.2	13.17	1.350E 04	2.854E 02	1.716E 06	5.514E 05	5.427E 03
920	1600	4.209E-17	4.359E-07	138.3	12.84	9.838E 03	1.989E 02	1.432E 06	5.269E 05	5.366E 03
940	1600	3.553E-17	3.781E-07	142.9	12.50	7.183E 03	1.388E 02	1.196E 06	5.036E 05	5.306E 03
960	1600	3.008E-17	3.295E-07	147.9	12.14	5.253E 03	9.714E 01	1.000E 06	4.815E 05	5.246E 03
980	1600	2.553E-17	2.885E-07	153.4	11.77	3.849E 03	6.809E 01	8.370E 05	4.604E 05	5.188E 03
1000	1600	2.174E-17	2.538E-07	159.4	11.39	2.824E 03	4.783E 01	7.013E 05	4.404E 05	5.131E 03
1050	1600	1.474E-17	1.884E-07	176.8	10.41	1.313E 03	1.994E 01	4.524E 05	3.945E 05	4.991E 03
1100	1600	1.021E-17	1.442E-07	198.0	9.42	6.164E 02	8.409E 00	2.936E 05	3.539E 05	4.858E 03
1150	1600	7.242E-18	1.136E-07	222.9	8.48	2.923E 02	3.587E 00	1.916E 05	3.179E 05	4.729E 03
1200	1600	5.270E-18	9.197E-08	251.3	7.62	1.400E 02	1.548E 00	1.258E 05	2.860E 05	4.606E 03
1250	1600	3.940E-18	7.623E-08	282.3	6.88	6.772E 01	6.753E-01	8.299E 04	2.577E 05	4.487E 03
1300	1600	3.027E-18	6.446E-08	314.9	6.25	3.306E 01	2.978E-01	5.507E 04	2.325E 05	4.373E 03
1350	1600	2.388E-18	5.542E-08	347.6	5.73	1.629E 01	1.327E-01	3.674E 04	2.100E 05	4.263E 03
1400	1600	1.932E-18	4.830E-08	379.4	5.32	8.103E 00	5.977E-02	2.464E 04	1.900E 05	4.158E 03
1450	1600	1.598E-18	4.255E-08	409.2	5.00	4.066E 00	2.719E-02	1.660E 04	1.720E 05	4.056E 03
1500	1600	1.348E-18	3.780E-08	436.5	4.74	2.058E 00	1.250E-02	1.125E 04	1.560E 05	3.958E 03
1550	1600	1.156E-18	3.382E-08	461.0	4.55	1.051E 00	5.800E-03	7.657E 03	1.416E 05	3.864E 03
1600	1600	1.006E-18	3.042E-08	482.8	4.40	5.409E-01	2.718E-03	5.238E 03	1.288E 05	3.773E 03
1650	1600	8.847E-19	2.748E-08	502.1	4.28	2.808E-01	1.285E-03	3.600E 03	1.172E 05	3.685E 03
1700	1600	7.854E-19	2.492E-08	519.2	4.19	1.470E-01	6.137E-04	2.486E 03	1.068E 05	3.600E 03
1750	1600	7.024E-19	2.266E-08	534.6	4.12	7.754E-02	2.957E-04	1.724E 03	9.741E 04	3.518E 03
1800	1600	6.319E-19	2.067E-08	548.5	4.07	4.123E-02	1.437E-04	1.201E 03	8.896E 04	3.439E 03
1850	1600	5.713E-19	1.889E-08	561.3	4.02	2.209E-02	7.049E-05	8.407E 02	8.133E 04	3.363E 03
1900	1600	5.185E-19	1.729E-08	573.2	3.99	1.193E-02	3.487E-05	5.909E 02	7.444E 04	3.290E 03
1950	1600	4.721E-19	1.586E-08	584.5	3.96	6.487E-03	1.739E-05	4.171E 02	6.820E 04	3.218E 03
2000	1600	4.310E-19	1.457E-08	595.2	3.93	3.554E-03	8.749E-06	2.956E 02	6.255E 04	3.150E 03
2050	1600	3.944E-19	1.341E-08	605.7	3.91	1.961E-03	4.437E-06	2.104E 02	5.743E 04	3.083E 03

TIME (IN HOURS)= 11.000, COS(TH)= -9.6593E-01, INT GRAD= 1.6269E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	505	1.187E-11	1.846E-02	16.5	26.98	1.940E 11	3.613E 10	3.495E 10	1.581E 07	2.984E 04
140	634	5.455E-12	1.083E-02	21.2	26.54	8.838E 10	1.520E 10	2.021E 10	1.161E 07	2.528E 04
150	754	2.941E-12	7.056E-03	25.6	26.14	4.709E 10	7.592E 09	1.309E 10	9.140E 06	1.924E 04
160	868	1.758E-12	4.922E-03	30.0	25.76	2.776E 10	4.236E 09	9.113E 09	7.516E 06	1.650E 04
170	972	1.133E-12	3.604E-03	34.2	25.40	1.762E 10	2.561E 09	6.693E 09	6.390E 06	1.456E 04
180	1065	7.730E-13	2.732E-03	38.1	25.06	1.182E 10	1.644E 09	5.120E 09	5.576E 06	1.313E 04
190	1148	5.509E-13	2.127E-03	41.8	24.72	8.271E 09	1.106E 09	4.043E 09	4.969E 06	1.206E 04
200	1221	4.062E-13	1.690E-03	45.1	24.40	5.983E 09	7.707E 08	3.273E 09	4.501E 06	1.124E 04
220	1338	2.383E-13	1.115E-03	51.1	23.77	3.366E 09	4.048E 08	2.265E 09	3.831E 06	1.008E 04
240	1425	1.502E-13	7.679E-04	56.1	23.17	2.025E 09	2.287E 08	1.649E 09	3.375E 06	9.312E 03
260	1488	9.948E-14	5.451E-04	60.5	22.58	1.274E 09	1.355E 08	1.241E 09	3.041E 06	8.780E 03
280	1535	6.829E-14	3.958E-04	64.4	22.02	8.264E 08	8.303E 07	9.562E 08	2.783E 06	8.392E 03
300	1569	4.817E-14	2.925E-04	67.9	21.48	5.478E 08	5.207E 07	7.487E 08	2.575E 06	8.096E 03
320	1594	3.471E-14	2.194E-04	71.1	20.96	3.688E 08	3.322E 07	5.931E 08	2.400E 06	7.862E 03
340	1612	2.544E-14	1.666E-04	74.1	20.47	2.512E 08	2.146E 07	4.738E 08	2.250E 06	7.670E 03
360	1625	1.892E-14	1.278E-04	76.9	20.01	1.727E 08	1.400E 07	3.810E 08	2.117E 06	7.508E 03
380	1635	1.425E-14	9.894E-05	79.5	19.57	1.195E 08	9.205E 06	3.079E 08	1.997E 06	7.367E 03
400	1642	1.085E-14	7.724E-05	82.0	19.17	8.315E 07	6.089E 06	2.497E 08	1.889E 06	7.241E 03
420	1647	8.336E-15	6.075E-05	84.4	18.80	5.814E 07	4.048E 06	2.032E 08	1.789E 06	7.126E 03
440	1652	6.462E-15	4.809E-05	86.7	18.45	4.080E 07	2.703E 06	1.658E 08	1.697E 06	7.019E 03
460	1655	5.049E-15	3.830E-05	88.9	18.14	2.874E 07	1.811E 06	1.355E 08	1.611E 06	6.919E 03
480	1657	3.973E-15	3.066E-05	91.0	17.85	2.030E 07	1.218E 06	1.110E 08	1.531E 06	6.823E 03
500	1659	3.146E-15	2.467E-05	93.0	17.58	1.438E 07	8.219E 05	9.112E 07	1.455E 06	6.732E 03
520	1660	2.506E-15	1.994E-05	95.0	17.34	1.021E 07	5.561E 05	7.489E 07	1.384E 06	6.645E 03
540	1661	2.007E-15	1.619E-05	96.8	17.12	7.270E 06	3.773E 05	6.164E 07	1.318E 06	6.560E 03
560	1662	1.615E-15	1.319E-05	98.6	16.92	5.187E 06	2.566E 05	5.081E 07	1.255E 06	6.477E 03
580	1663	1.305E-15	1.079E-05	100.4	16.72	3.709E 06	1.750E 05	4.193E 07	1.195E 06	6.397E 03
600	1664	1.059E-15	8.855E-06	102.1	16.54	2.658E 06	1.196E 05	3.465E 07	1.139E 06	6.319E 03
620	1664	8.629E-16	7.291E-06	103.8	16.37	1.909E 06	8.196E 04	2.867E 07	1.086E 06	6.242E 03
640	1665	7.054E-16	6.022E-06	105.4	16.21	1.374E 06	5.629E 04	2.375E 07	1.035E 06	6.167E 03
660	1665	5.785E-16	4.989E-06	107.1	16.05	9.905E 05	3.875E 04	1.969E 07	9.878E 05	6.094E 03
680	1665	4.758E-16	4.145E-06	108.8	15.89	7.155E 05	2.673E 04	1.635E 07	9.425E 05	6.022E 03
700	1665	3.925E-16	3.454E-06	110.6	15.73	5.179E 05	1.848E 04	1.359E 07	8.996E 05	5.952E 03
720	1666	3.246E-16	2.887E-06	112.3	15.57	3.756E 05	1.280E 04	1.131E 07	8.589E 05	5.882E 03

740	1666	2.691E-16	2.420E-06	114.2	15.41	2.729E 05	8.890E 03	9.416E 06	8.203E 05	5.815E 03
760	1666	2.237E-16	2.034E-06	116.2	15.23	1.986E 05	6.186E 03	7.852E 06	7.837E 05	5.748E 03
780	1666	1.863E-16	1.715E-06	118.3	15.05	1.448E 05	4.313E 03	6.554E 06	7.488E 05	5.683E 03
800	1666	1.555E-16	1.450E-06	120.5	14.86	1.058E 05	3.014E 03	5.476E 06	7.158E 05	5.619E 03
820	1667	1.301E-16	1.230E-06	122.8	14.66	7.743E 04	2.110E 03	4.580E 06	6.843E 05	5.555E 03
840	1667	1.091E-16	1.047E-06	125.4	14.44	5.677E 04	1.480E 03	3.835E 06	6.544E 05	5.494E 03
860	1667	9.168E-17	8.943E-07	128.2	14.21	4.169E 04	1.040E 03	3.214E 06	6.260E 05	5.433E 03
880	1667	7.720E-17	7.665E-07	131.1	13.96	3.067E 04	7.328E 02	2.696E 06	5.990E 05	5.373E 03
900	1667	6.515E-17	6.593E-07	134.4	13.70	2.260E 04	5.171E 02	2.264E 06	5.733E 05	5.314E 03
920	1667	5.510E-17	5.692E-07	138.0	13.42	1.668E 04	3.656E 02	1.903E 06	5.488E 05	5.256E 03
940	1667	4.670E-17	4.934E-07	141.9	13.12	1.234E 04	2.590E 02	1.601E 06	5.255E 05	5.200E 03
960	1667	3.968E-17	4.294E-07	146.1	12.81	9.137E 03	1.838E 02	1.349E 06	5.033E 05	5.144E 03
980	1667	3.379E-17	3.752E-07	150.7	12.48	6.778E 03	1.307E 02	1.137E 06	4.822E 05	5.089E 03
1000	1667	2.885E-17	3.293E-07	155.8	12.14	5.037E 03	9.313E 01	9.593E 05	4.620E 05	5.035E 03
1050	1667	1.965E-17	2.422E-07	170.5	11.25	2.414E 03	4.021E 01	6.299E 05	4.157E 05	4.904E 03
1100	1667	1.363E-17	1.832E-07	188.5	10.31	1.169E 03	1.756E 01	4.159E 05	3.746E 05	4.777E 03
1150	1667	9.638E-18	1.425E-07	210.1	9.38	5.711E 02	7.753E 00	2.761E 05	3.380E 05	4.656E 03
1200	1667	6.964E-18	1.138E-07	235.2	8.48	2.818E 02	3.460E 00	1.843E 05	3.053E 05	4.540E 03
1250	1667	5.150E-18	9.306E-08	263.7	7.67	1.403E 02	1.561E 00	1.237E 05	2.762E 05	4.427E 03
1300	1667	3.902E-18	7.778E-08	294.7	6.95	7.052E 01	7.114E-01	8.346E 04	2.502E 05	4.319E 03
1350	1667	3.030E-18	6.621E-08	327.3	6.34	3.576E 01	3.275E-01	5.659E 04	2.270E 05	4.215E 03
1400	1667	2.411E-18	5.724E-08	360.3	5.84	1.829E 01	1.523E-01	3.856E 04	2.061E 05	4.115E 03
1450	1667	1.962E-18	5.012E-08	392.6	5.42	9.435E 00	7.154E-02	2.641E 04	1.874E 05	4.018E 03
1500	1667	1.630E-18	4.434E-08	423.4	5.10	4.908E 00	3.392E-02	1.817E 04	1.706E 05	3.925E 03
1550	1667	1.380E-18	3.955E-08	451.9	4.83	2.575E 00	1.624E-02	1.256E 04	1.555E 05	3.835E 03
1600	1667	1.187E-18	3.552E-08	477.9	4.63	1.362E 00	7.843E-03	8.726E 03	1.419E 05	3.748E 03
1650	1667	1.034E-18	3.207E-08	501.2	4.47	7.257E-01	3.824E-03	6.089E 03	1.297E 05	3.665E 03
1700	1667	9.117E-19	2.909E-08	522.2	4.34	3.899E-01	1.881E-03	4.267E 03	1.186E 05	3.584E 03
1750	1667	8.111E-19	2.648E-08	540.9	4.25	2.110E-01	9.331E-04	3.004E 03	1.086E 05	3.506E 03
1800	1667	7.271E-19	2.417E-08	557.7	4.17	1.151E-01	4.670E-04	2.124E 03	9.953E 04	3.430E 03
1850	1667	6.558E-19	2.213E-08	573.0	4.11	6.324E-02	2.357E-04	1.508E 03	9.133E 04	3.357E 03
1900	1667	5.944E-19	2.030E-08	587.0	4.06	3.500E-02	1.199E-04	1.075E 03	8.388E 04	3.287E 03
1950	1667	5.411E-19	1.866E-08	600.0	4.02	1.951E-02	6.152E-05	7.693E 02	7.713E 04	3.218E 03
2000	1667	4.942E-19	1.718E-08	612.2	3.99	1.095E-02	3.181E-05	5.529E 02	7.099E 04	3.152E 03
2050	1667	4.526E-19	1.585E-08	623.8	3.96	6.189E-03	1.658E-05	3.989E 02	6.540E 04	3.088E 03

TIME (IN HOURS)= 12.000, COS(TH)=-10.0000E-01, INT GRAD= 1.6239E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	506	1.185E-11	1.847E-02	16.5	26.98	1.937E 11	3.607E 10	3.488E 10	1.578E 07	2.978E 04
140	640	5.419E-12	1.087E-02	21.4	26.55	8.781E 10	1.511E 10	2.005E 10	1.150E 07	2.305E 04
150	768	2.915E-12	7.120E-03	26.1	26.15	4.669E 10	7.538E 09	1.292E 10	8.988E 06	1.890E 04
160	888	1.747E-12	5.004E-03	30.7	25.78	2.760E 10	4.221E 09	8.990E 09	7.358E 06	1.613E 04
170	998	1.131E-12	3.691E-03	35.1	25.43	1.761E 10	2.569E 09	6.614E 09	6.243E 06	1.418E 04
180	1096	7.764E-13	2.819E-03	39.2	25.10	1.189E 10	1.663E 09	5.077E 09	5.447E 06	1.278E 04
190	1182	5.569E-13	2.209E-03	42.9	24.77	8.386E 09	1.128E 09	4.025E 09	4.856E 06	1.173E 04
200	1257	4.133E-13	1.766E-03	46.3	24.46	6.111E 09	7.928E 08	3.271E 09	4.402E 06	1.093E 04
220	1377	2.454E-13	1.178E-03	52.4	23.86	3.487E 09	4.232E 08	2.282E 09	3.755E 06	9.810E 03
240	1466	1.563E-13	8.186E-04	57.5	23.27	2.126E 09	2.426E 08	1.674E 09	3.315E 06	9.073E 03
260	1532	1.045E-13	5.858E-04	61.9	22.71	1.354E 09	1.458E 08	1.269E 09	2.993E 06	8.560E 03
280	1579	7.230E-14	4.284E-04	65.8	22.16	8.881E 08	9.050E 07	9.842E 08	2.744E 06	8.185E 03
300	1614	5.137E-14	3.187E-04	69.4	21.63	5.951E 08	5.747E 07	7.755E 08	2.543E 06	7.900E 03
320	1640	3.726E-14	2.405E-04	72.6	21.13	4.049E 08	3.711E 07	6.180E 08	2.374E 06	7.674E 03
340	1659	2.748E-14	1.836E-04	75.6	20.64	2.787E 08	2.427E 07	4.967E 08	2.228E 06	7.488E 03
360	1673	2.055E-14	1.416E-04	78.4	20.18	1.935E 08	1.602E 07	4.017E 08	2.099E 06	7.331E 03
380	1683	1.555E-14	1.102E-04	81.1	19.75	1.353E 08	1.065E 07	3.264E 08	1.983E 06	7.194E 03
400	1691	1.190E-14	8.645E-05	83.7	19.35	9.512E 07	7.129E 06	2.663E 08	1.878E 06	7.072E 03
420	1697	9.188E-15	6.831E-05	86.2	18.98	6.718E 07	4.794E 06	2.180E 08	1.781E 06	6.961E 03
440	1701	7.155E-15	5.433E-05	88.5	18.63	4.763E 07	3.238E 06	1.788E 08	1.691E 06	6.858E 03
460	1705	5.614E-15	4.347E-05	90.8	18.31	3.388E 07	2.196E 06	1.470E 08	1.608E 06	6.762E 03
480	1708	4.437E-15	3.496E-05	92.9	18.02	2.418E 07	1.494E 06	1.212E 08	1.530E 06	6.670E 03
500	1710	3.528E-15	2.826E-05	95.0	17.75	1.730E 07	1.020E 06	9.999E 07	1.456E 06	6.583E 03
520	1711	2.822E-15	2.294E-05	97.0	17.50	1.241E 07	6.978E 05	8.265E 07	1.387E 06	6.498E 03
540	1713	2.269E-15	1.871E-05	98.9	17.27	8.925E 06	4.789E 05	6.842E 07	1.322E 06	6.417E 03
560	1714	1.834E-15	1.531E-05	100.8	17.06	6.432E 06	3.295E 05	5.672E 07	1.261E 06	6.338E 03
580	1715	1.488E-15	1.258E-05	102.6	16.87	4.646E 06	2.273E 05	4.707E 07	1.203E 06	6.262E 03
600	1715	1.213E-15	1.037E-05	104.3	16.69	3.363E 06	1.571E 05	3.912E 07	1.148E 06	6.187E 03
620	1716	9.924E-16	8.572E-06	106.1	16.52	2.439E 06	1.089E 05	3.255E 07	1.096E 06	6.114E 03
640	1716	8.147E-16	7.110E-06	107.8	16.35	1.773E 06	7.564E 04	2.711E 07	1.046E 06	6.042E 03
660	1717	6.710E-16	5.914E-06	109.5	16.20	1.291E 06	5.266E 04	2.261E 07	9.994E 05	5.972E 03
680	1717	5.543E-16	4.933E-06	111.2	16.04	9.417E 05	3.673E 04	1.888E 07	9.549E 05	5.904E 03
700	1718	4.592E-16	4.127E-06	112.9	15.89	6.883E 05	2.568E 04	1.578E 07	9.127E 05	5.837E 03
720	1718	3.814E-16	3.462E-06	114.7	15.74	5.040E 05	1.799E 04	1.320E 07	8.727E 05	5.771E 03

740	1718	3.176E-16	2.912E-06	116.5	15.58	3.697E 05	1.263E 04	1.106E 07	8.346E 05	5.706E 03
760	1718	2.650E-16	2.456E-06	118.4	15.42	2.717E 05	8.887E 03	9.270E 06	7.984E 05	5.643E 03
780	1719	2.217E-16	2.077E-06	120.3	15.25	2.001E 05	6.265E 03	7.780E 06	7.639E 05	5.580E 03
800	1719	1.859E-16	1.761E-06	122.4	15.08	1.476E 05	4.425E 03	6.537E 06	7.312E 05	5.519E 03
820	1719	1.561E-16	1.498E-06	124.6	14.90	1.090E 05	3.132E 03	5.497E 06	7.000E 05	5.459E 03
840	1719	1.314E-16	1.278E-06	127.0	14.70	8.068E 04	2.221E 03	4.627E 06	6.704E 05	5.400E 03
860	1719	1.109E-16	1.093E-06	129.5	14.50	5.981E 04	1.578E 03	3.899E 06	6.421E 05	5.342E 03
880	1719	9.372E-17	9.382E-07	132.2	14.28	4.441E 04	1.123E 03	3.289E 06	6.152E 05	5.285E 03
900	1719	7.938E-17	8.078E-07	135.2	14.04	3.303E 04	8.011E 02	2.776E 06	5.896E 05	5.229E 03
920	1719	6.736E-17	6.979E-07	138.4	13.80	2.461E 04	5.725E 02	2.346E 06	5.652E 05	5.174E 03
940	1719	5.729E-17	6.051E-07	141.8	13.53	1.837E 04	4.098E 02	1.984E 06	5.419E 05	5.120E 03
960	1719	4.882E-17	5.264E-07	145.6	13.26	1.373E 04	2.939E 02	1.680E 06	5.197E 05	5.066E 03
980	1719	4.169E-17	4.597E-07	149.7	12.96	1.028E 04	2.112E 02	1.424E 06	4.985E 05	5.014E 03
1000	1719	3.569E-17	4.030E-07	154.2	12.66	7.706E 03	1.520E 02	1.207E 06	4.783E 05	4.962E 03
1050	1719	2.443E-17	2.950E-07	167.1	11.84	3.777E 03	6.733E 01	8.030E 05	4.317E 05	4.837E 03
1100	1719	1.699E-17	2.216E-07	182.9	10.96	1.869E 03	3.016E 01	5.370E 05	3.902E 05	4.716E 03
1150	1719	1.201E-17	1.708E-07	202.0	10.06	9.337E 02	1.365E 01	3.610E 05	3.552E 05	4.600E 03
1200	1719	8.657E-18	1.350E-07	224.6	9.17	4.707E 02	6.244E 00	2.440E 05	3.201E 05	4.488E 03
1250	1719	6.367E-18	1.093E-07	250.6	8.32	2.394E 02	2.885E 00	1.657E 05	2.905E 05	4.381E 03
1300	1719	4.786E-18	9.052E-08	279.6	7.56	1.229E 02	1.347E 00	1.131E 05	2.639E 05	4.277E 03
1350	1719	3.679E-18	7.640E-08	311.0	6.88	6.360E 01	6.350E-01	7.763E 04	2.401E 05	4.177E 03
1400	1719	2.893E-18	6.557E-08	343.9	6.31	3.320E 01	3.023E-01	5.353E 04	2.187E 05	4.080E 03
1450	1719	2.326E-18	5.707E-08	377.1	5.83	1.748E 01	1.453E-01	3.708E 04	1.994E 05	3.987E 03
1500	1719	1.910E-18	5.026E-08	409.6	5.43	9.274E 00	7.045E-02	2.581E 04	1.821E 05	3.898E 03
1550	1719	1.598E-18	4.468E-08	440.6	5.11	4.961E 00	3.449E-02	1.804E 04	1.664E 05	3.811E 03
1600	1719	1.361E-18	4.003E-08	469.6	4.86	2.675E 00	1.703E-02	1.267E 04	1.523E 05	3.728E 03
1650	1719	1.176E-18	3.609E-08	496.1	4.66	1.453E 00	8.487E-03	8.939E 03	1.395E 05	3.647E 03
1700	1719	1.029E-18	3.271E-08	520.1	4.50	7.957E-01	4.266E-03	6.333E 03	1.280E 05	3.569E 03
1750	1719	9.105E-19	2.977E-08	541.8	4.37	4.388E-01	2.162E-03	4.506E 03	1.175E 05	3.493E 03
1800	1719	8.126E-19	2.719E-08	561.3	4.27	2.438E-01	1.105E-03	3.219E 03	1.080E 05	3.420E 03
1850	1719	7.305E-19	2.491E-08	579.0	4.19	1.364E-01	5.694E-04	2.310E 03	9.932E 04	3.350E 03
1900	1719	6.607E-19	2.288E-08	595.1	4.13	7.687E-02	2.958E-04	1.664E 03	9.147E 04	3.281E 03
1950	1719	6.006E-19	2.105E-08	609.8	4.08	4.362E-02	1.549E-04	1.203E 03	8.432E 04	3.215E 03
2000	1719	5.482E-19	1.941E-08	623.5	4.04	2.492E-02	8.170E-05	8.732E 02	7.780E 04	3.151E 03
2050	1719	5.021E-19	1.793E-08	636.4	4.00	1.433E-02	4.344E-05	6.363E 02	7.186E 04	3.089E 03

TIME (IN HOURS)= 13.000, COS(TH)= -9.6593E-01, INT GRAD= 1.6255E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	507	1.182E-11	1.848E-02	16.6	26.98	1.933E 11	3.599E 10	3.480E 10	1.573E 07	2.969E 04
140	647	5.387E-12	1.091E-02	21.6	26.55	8.731E 10	1.503E 10	1.990E 10	1.140E 07	2.283E 04
150	780	2.898E-12	7.185E-03	26.5	26.16	4.642E 10	7.505E 09	1.280E 10	8.862E 06	1.862E 04
160	905	1.741E-12	5.079E-03	31.3	25.80	2.753E 10	4.221E 09	8.906E 09	7.239E 06	1.584E 04
170	1018	1.133E-12	3.768E-03	35.8	25.46	1.765E 10	2.584E 09	6.567E 09	6.140E 06	1.391E 04
180	1119	7.815E-13	2.892E-03	39.9	25.13	1.199E 10	1.684E 09	5.057E 09	5.359E 06	1.253E 04
190	1206	5.635E-13	2.277E-03	43.7	24.82	8.504E 09	1.149E 09	4.022E 09	4.782E 06	1.151E 04
200	1282	4.202E-13	1.827E-03	47.2	24.51	6.231E 09	8.129E 08	3.280E 09	4.341E 06	1.073E 04
220	1403	2.515E-13	1.227E-03	53.2	23.92	3.591E 09	4.388E 08	2.302E 09	3.711E 06	9.644E 03
240	1493	1.613E-13	8.576E-04	58.4	23.35	2.208E 09	2.540E 08	1.698E 09	3.282E 06	8.929E 03
260	1558	1.085E-13	6.165E-04	62.8	22.80	1.417E 09	1.540E 08	1.293E 09	2.968E 06	8.431E 03
280	1607	7.544E-14	4.527E-04	66.7	22.26	9.360E 08	9.633E 07	1.007E 09	2.725E 06	8.066E 03
300	1642	5.382E-14	3.381E-04	70.2	21.74	6.313E 08	6.163E 07	7.962E 08	2.527E 06	7.787E 03
320	1669	3.918E-14	2.559E-04	73.5	21.24	4.322E 08	4.008E 07	6.368E 08	2.361E 06	7.565E 03
340	1688	2.899E-14	1.960E-04	76.5	20.76	2.993E 08	2.639E 07	5.135E 08	2.217E 06	7.382E 03
360	1703	2.175E-14	1.516E-04	79.4	20.30	2.091E 08	1.754E 07	4.167E 08	2.090E 06	7.227E 03
380	1714	1.651E-14	1.184E-04	82.1	19.88	1.470E 08	1.174E 07	3.398E 08	1.976E 06	7.092E 03
400	1722	1.267E-14	9.313E-05	84.7	19.47	1.040E 08	7.913E 06	2.781E 08	1.873E 06	6.972E 03
420	1728	9.806E-15	7.379E-05	87.2	19.10	7.388E 07	5.359E 06	2.283E 08	1.777E 06	6.862E 03
440	1733	7.656E-15	5.885E-05	89.6	18.75	5.270E 07	3.645E 06	1.880E 08	1.689E 06	6.761E 03
460	1737	6.023E-15	4.721E-05	91.9	18.43	3.772E 07	2.489E 06	1.551E 08	1.607E 06	6.666E 03
480	1740	4.771E-15	3.808E-05	94.1	18.13	2.708E 07	1.705E 06	1.282E 08	1.530E 06	6.576E 03
500	1743	3.803E-15	3.086E-05	96.2	17.86	1.950E 07	1.172E 06	1.062E 08	1.457E 06	6.490E 03
520	1745	3.050E-15	2.513E-05	98.3	17.61	1.407E 07	8.077E 05	8.808E 07	1.389E 06	6.408E 03
540	1746	2.458E-15	2.054E-05	100.3	17.38	1.018E 07	5.582E 05	7.317E 07	1.325E 06	6.328E 03
560	1748	1.991E-15	1.686E-05	102.2	17.16	7.384E 06	3.868E 05	6.086E 07	1.265E 06	6.251E 03
580	1749	1.620E-15	1.389E-05	104.0	16.97	5.367E 06	2.687E 05	5.070E 07	1.207E 06	6.176E 03
600	1749	1.324E-15	1.148E-05	105.8	16.78	3.909E 06	1.871E 05	4.228E 07	1.153E 06	6.103E 03
620	1750	1.086E-15	9.514E-06	107.6	16.61	2.853E 06	1.306E 05	3.530E 07	1.102E 06	6.032E 03
640	1751	8.939E-16	7.912E-06	109.3	16.45	2.086E 06	9.135E 04	2.951E 07	1.053E 06	5.963E 03
660	1751	7.381E-16	6.599E-06	111.0	16.29	1.528E 06	6.405E 04	2.470E 07	1.007E 06	5.895E 03
680	1752	6.114E-16	5.518E-06	112.7	16.14	1.122E 06	4.500E 04	2.069E 07	9.627E 05	5.828E 03
700	1752	5.078E-16	4.628E-06	114.5	15.99	8.251E 05	3.168E 04	1.735E 07	9.210E 05	5.763E 03
720	1753	4.229E-16	3.891E-06	116.2	15.84	6.079E 05	2.235E 04	1.457E 07	8.813E 05	5.699E 03

740	1753	3.531E-16	3.280E-06	118.0	15.69	4.487E 05	1.580E 04	1.225E 07	8.435E 05	5.636E 03
760	1753	2.955E-16	2.772E-06	119.9	15.54	3.318E 05	1.119E 04	1.030E 07	8.076E 05	5.575E 03
780	1753	2.478E-16	2.349E-06	121.8	15.38	2.458E 05	7.946E 03	8.677E 06	7.735E 05	5.514E 03
800	1754	2.083E-16	1.996E-06	123.8	15.21	1.823E 05	5.651E 03	7.315E 06	7.409E 05	5.455E 03
820	1754	1.755E-16	1.701E-06	125.9	15.04	1.355E 05	4.027E 03	6.173E 06	7.100E 05	5.397E 03
840	1754	1.481E-16	1.453E-06	128.2	14.86	1.009E 05	2.875E 03	5.214E 06	6.804E 05	5.339E 03
860	1754	1.252E-16	1.245E-06	130.6	14.67	7.525E 04	2.057E 03	4.408E 06	6.523E 05	5.283E 03
880	1754	1.061E-16	1.070E-06	133.2	14.47	5.621E 04	1.474E 03	3.731E 06	6.255E 05	5.228E 03
900	1754	9.009E-17	9.219E-07	135.9	14.25	4.205E 04	1.058E 03	3.160E 06	6.000E 05	5.173E 03
920	1754	7.663E-17	7.970E-07	138.9	14.02	3.152E 04	7.614E 02	2.679E 06	5.756E 05	5.120E 03
940	1754	6.531E-17	6.913E-07	142.1	13.78	2.366E 04	5.487E 02	2.274E 06	5.523E 05	5.067E 03
960	1754	5.577E-17	6.015E-07	145.6	13.52	1.778E 04	3.961E 02	1.931E 06	5.302E 05	5.015E 03
980	1754	4.772E-17	5.253E-07	149.4	13.25	1.339E 04	2.865E 02	1.642E 06	5.090E 05	4.964E 03
1000	1754	4.092E-17	4.603E-07	153.5	12.97	1.010E 04	2.076E 02	1.397E 06	4.888E 05	4.914E 03
1050	1754	2.812E-17	3.362E-07	165.4	12.20	5.021E 03	9.346E 01	9.368E 05	4.421E 05	4.793E 03
1100	1754	1.960E-17	2.516E-07	180.0	11.36	2.520E 03	4.253E 01	6.315E 05	4.004E 05	4.675E 03
1150	1754	1.388E-17	1.929E-07	197.6	10.49	1.276E 03	1.956E 01	4.279E 05	3.631E 05	4.562E 03
1200	1754	9.994E-18	1.516E-07	218.5	9.61	6.521E 02	9.086E 00	2.915E 05	3.297E 05	4.454E 03
1250	1754	7.333E-18	1.220E-07	242.8	8.77	3.362E 02	4.264E 00	1.995E 05	2.998E 05	4.349E 03
1300	1754	5.490E-18	1.004E-07	270.3	7.98	1.748E 02	2.021E 00	1.373E 05	2.729E 05	4.248E 03
1350	1754	4.197E-18	8.422E-08	300.5	7.27	9.169E 01	9.671E-01	9.489E 04	2.487E 05	4.151E 03
1400	1754	3.279E-18	7.190E-08	332.7	6.65	4.849E 01	4.672E-01	6.591E 04	2.270E 05	4.057E 03
1450	1754	2.617E-18	6.231E-08	365.9	6.13	2.585E 01	2.278E-01	4.599E 04	2.074E 05	3.966E 03
1500	1754	2.132E-18	5.467E-08	399.1	5.69	1.389E 01	1.121E-01	3.224E 04	1.897E 05	3.879E 03
1550	1754	1.771E-18	4.847E-08	431.4	5.33	7.526E 00	5.566E-02	2.270E 04	1.737E 05	3.794E 03
1600	1754	1.497E-18	4.333E-08	462.0	5.04	4.108E 00	2.788E-02	1.606E 04	1.592E 05	3.713E 03
1650	1754	1.286E-18	3.902E-08	490.5	4.81	2.259E 00	1.409E-02	1.141E 04	1.461E 05	3.634E 03
1700	1754	1.119E-18	3.533E-08	516.6	4.62	1.252E 00	7.177E-03	8.137E 03	1.342E 05	3.558E 03
1750	1754	9.855E-19	3.214E-08	540.4	4.47	6.986E-01	3.688E-03	5.829E 03	1.234E 05	3.484E 03
1800	1754	8.764E-19	2.935E-08	561.8	4.35	3.927E-01	1.910E-03	4.192E 03	1.136E 05	3.413E 03
1850	1754	7.857E-19	2.690E-08	581.3	4.26	2.223E-01	9.973E-04	3.028E 03	1.047E 05	3.344E 03
1900	1754	7.091E-19	2.471E-08	598.9	4.19	1.267E-01	5.249E-04	2.195E 03	9.660E 04	3.277E 03
1950	1754	6.436E-19	2.276E-08	615.0	4.13	7.271E-02	2.783E-04	1.598E 03	8.919E 04	3.212E 03
2000	1754	5.869E-19	2.100E-08	629.9	4.08	4.200E-02	1.487E-04	1.167E 03	8.243E 04	3.149E 03
2050	1754	5.373E-19	1.941E-08	643.8	4.04	2.442E-02	8.008E-05	8.558E 02	7.625E 04	3.089E 03

TIME (IN HOURS)= 14.000, COS(TH)= -8.6603E-01, INT GRAD= 1.6315E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	509	1.180E-11	1.849E-02	16.6	26.98	1.928E 11	3.591E 10	3.470E 10	1.568E 07	2.960E 04
140	652	5.365E-12	1.095E-02	21.7	26.55	8.695E 10	1.498E 10	1.979E 10	1.131E 07	2.265E 04
150	789	2.889E-12	7.241E-03	26.8	26.17	4.630E 10	7.495E 09	1.272E 10	8.777E 06	1.843E 04
160	916	1.742E-12	5.138E-03	31.6	25.81	2.755E 10	4.231E 09	8.866E 09	7.168E 06	1.566E 04
170	1030	1.137E-12	3.824E-03	36.1	25.47	1.774E 10	2.602E 09	6.554E 09	6.085E 06	1.376E 04
180	1130	7.876E-13	2.943E-03	40.3	25.15	1.210E 10	1.703E 09	5.059E 09	5.318E 06	1.241E 04
190	1218	5.697E-13	2.322E-03	44.1	24.84	8.610E 09	1.167E 09	4.034E 09	4.751E 06	1.141E 04
200	1293	4.261E-13	1.867E-03	47.5	24.54	6.329E 09	8.285E 08	3.297E 09	4.318E 06	1.065E 04
220	1413	2.562E-13	1.257E-03	53.5	23.96	3.667E 09	4.499E 08	2.323E 09	3.700E 06	9.585E 03
240	1502	1.648E-13	8.799E-04	58.6	23.39	2.263E 09	2.616E 08	1.718E 09	3.277E 06	8.886E 03
260	1567	1.111E-13	6.334E-04	63.0	22.84	1.457E 09	1.591E 08	1.311E 09	2.967E 06	8.397E 03
280	1615	7.736E-14	4.655E-04	66.9	22.31	9.646E 08	9.977E 07	1.022E 09	2.725E 06	8.037E 03
300	1650	5.525E-14	3.478E-04	70.4	21.79	6.518E 08	6.397E 07	8.093E 08	2.528E 06	7.760E 03
320	1677	4.025E-14	2.635E-04	73.6	21.29	4.470E 08	4.168E 07	6.479E 08	2.363E 06	7.539E 03
340	1696	2.980E-14	2.019E-04	76.7	20.81	3.100E 08	2.749E 07	5.228E 08	2.219E 06	7.357E 03
360	1711	2.237E-14	1.563E-04	79.6	20.36	2.169E 08	1.830E 07	4.246E 08	2.092E 06	7.201E 03
380	1723	1.699E-14	1.221E-04	82.3	19.93	1.528E 08	1.228E 07	3.465E 08	1.978E 06	7.065E 03
400	1732	1.304E-14	9.613E-05	84.9	19.52	1.082E 08	8.289E 06	2.838E 08	1.874E 06	6.944E 03
420	1739	1.010E-14	7.623E-05	87.5	19.15	7.702E 07	5.624E 06	2.333E 08	1.779E 06	6.833E 03
440	1744	7.887E-15	6.084E-05	89.9	18.80	5.504E 07	3.833E 06	1.922E 08	1.690E 06	6.731E 03
460	1748	6.208E-15	4.885E-05	92.2	18.47	3.947E 07	2.623E 06	1.587E 08	1.608E 06	6.635E 03
480	1752	4.920E-15	3.943E-05	94.5	18.18	2.839E 07	1.801E 06	1.314E 08	1.531E 06	6.545E 03
500	1755	3.925E-15	3.198E-05	96.7	17.90	2.048E 07	1.241E 06	1.089E 08	1.459E 06	6.459E 03
520	1757	3.149E-15	2.606E-05	98.7	17.65	1.481E 07	8.572E 05	9.043E 07	1.391E 06	6.376E 03
540	1759	2.540E-15	2.133E-05	100.7	17.42	1.074E 07	5.939E 05	7.521E 07	1.327E 06	6.297E 03
560	1760	2.059E-15	1.752E-05	102.7	17.20	7.806E 06	4.126E 05	6.264E 07	1.267E 06	6.220E 03
580	1761	1.677E-15	1.444E-05	104.5	17.00	5.686E 06	2.873E 05	5.223E 07	1.210E 06	6.145E 03
600	1763	1.372E-15	1.195E-05	106.4	16.82	4.151E 06	2.006E 05	4.362E 07	1.156E 06	6.073E 03
620	1763	1.126E-15	9.917E-06	108.1	16.65	3.036E 06	1.404E 05	3.646E 07	1.104E 06	6.002E 03
640	1764	9.276E-16	8.255E-06	109.9	16.48	2.225E 06	9.845E 04	3.052E 07	1.056E 06	5.933E 03
660	1765	7.667E-16	6.891E-06	111.6	16.33	1.634E 06	6.920E 04	2.558E 07	1.010E 06	5.865E 03
680	1765	6.357E-16	5.768E-06	113.3	16.17	1.202E 06	4.875E 04	2.146E 07	9.659E 05	5.799E 03
700	1766	5.285E-16	4.842E-06	115.1	16.03	8.862E 05	3.441E 04	1.802E 07	9.243E 05	5.735E 03
720	1766	4.406E-16	4.075E-06	116.8	15.88	6.545E 05	2.434E 04	1.515E 07	8.848E 05	5.671E 03

740	1767	3.682E-16	3.438E-06	118.6	15.73	4.842E 05	1.726E 04	1.275E 07	8.471E 05	5.609E 03
760	1767	3.084E-16	2.908E-06	120.5	15.58	3.588E 05	1.226E 04	1.074E 07	8.113E 05	5.548E 03
780	1767	2.590E-16	2.467E-06	122.4	15.43	2.664E 05	8.723E 03	9.057E 06	7.772E 05	5.489E 03
800	1767	2.179E-16	2.097E-06	124.4	15.26	1.981E 05	6.221E 03	7.645E 06	7.448E 05	5.430E 03
820	1768	1.837E-16	1.788E-06	126.5	15.10	1.476E 05	4.445E 03	6.460E 06	7.139E 05	5.372E 03
840	1768	1.552E-16	1.529E-06	128.7	14.92	1.101E 05	3.182E 03	5.464E 06	6.844E 05	5.315E 03
860	1768	1.314E-16	1.311E-06	131.0	14.74	8.233E 04	2.282E 03	4.625E 06	6.564E 05	5.260E 03
880	1768	1.114E-16	1.127E-06	133.6	14.54	6.164E 04	1.640E 03	3.920E 06	6.296E 05	5.205E 03
900	1768	9.469E-17	9.714E-07	136.3	14.33	4.622E 04	1.180E 03	3.325E 06	6.041E 05	5.151E 03
920	1768	8.062E-17	8.401E-07	139.2	14.11	3.472E 04	8.514E 02	2.822E 06	5.797E 05	5.098E 03
940	1768	6.877E-17	7.288E-07	142.3	13.87	2.612E 04	6.151E 02	2.398E 06	5.565E 05	5.046E 03
960	1768	5.877E-17	6.342E-07	145.7	13.62	1.968E 04	4.452E 02	2.040E 06	5.343E 05	4.995E 03
980	1768	5.033E-17	5.538E-07	149.4	13.36	1.485E 04	3.228E 02	1.736E 06	5.131E 05	4.945E 03
1000	1768	4.319E-17	4.853E-07	153.4	13.08	1.123E 04	2.345E 02	1.479E 06	4.929E 05	4.895E 03
1050	1768	2.972E-17	3.542E-07	164.9	12.34	5.612E 03	1.062E 02	9.951E 05	4.462E 05	4.775E 03
1100	1768	2.074E-17	2.647E-07	179.0	11.52	2.832E 03	4.865E 01	6.728E 05	4.044E 05	4.659E 03
1150	1768	1.469E-17	2.026E-07	196.0	10.66	1.442E 03	2.251E 01	4.573E 05	3.670E 05	4.548E 03
1200	1768	1.058E-17	1.589E-07	216.3	9.79	7.407E 02	1.052E 01	3.124E 05	3.335E 05	4.440E 03
1250	1768	7.759E-18	1.276E-07	239.9	8.94	3.839E 02	4.967E 00	2.145E 05	3.035E 05	4.337E 03
1300	1768	5.801E-18	1.047E-07	266.8	8.15	2.007E 02	2.368E 00	1.480E 05	2.765E 05	4.237E 03
1350	1768	4.426E-18	8.762E-08	296.5	7.43	1.058E 02	1.140E 00	1.026E 05	2.522E 05	4.140E 03
1400	1768	3.449E-18	7.464E-08	328.3	6.79	5.622E 01	5.538E-01	7.149E 04	2.303E 05	4.047E 03
1450	1768	2.745E-18	6.456E-08	361.4	6.25	3.012E 01	2.716E-01	5.003E 04	2.106E 05	3.958E 03
1500	1768	2.230E-18	5.656E-08	394.7	5.80	1.627E 01	1.344E-01	3.517E 04	1.927E 05	3.871E 03
1550	1768	1.847E-18	5.008E-08	427.4	5.42	8.855E 00	6.710E-02	2.483E 04	1.766E 05	3.788E 03
1600	1768	1.557E-18	4.473E-08	458.6	5.12	4.857E 00	3.379E-02	1.761E 04	1.620E 05	3.707E 03
1650	1768	1.334E-18	4.025E-08	487.8	4.87	2.684E 00	1.717E-02	1.254E 04	1.488E 05	3.629E 03
1700	1768	1.158E-18	3.643E-08	514.7	4.67	1.494E 00	8.793E-03	8.973E 03	1.368E 05	3.553E 03
1750	1768	1.018E-18	3.313E-08	539.3	4.52	8.376E-01	4.542E-03	6.444E 03	1.258E 05	3.480E 03
1800	1768	9.037E-19	3.026E-08	561.6	4.39	4.730E-01	2.365E-03	4.647E 03	1.159E 05	3.409E 03
1850	1768	8.092E-19	2.772E-08	581.7	4.29	2.689E-01	1.241E-03	3.365E 03	1.069E 05	3.341E 03
1900	1768	7.296E-19	2.547E-08	600.0	4.21	1.540E-01	6.564E-04	2.446E 03	9.867E 04	3.275E 03
1950	1768	6.618E-19	2.346E-08	616.8	4.15	8.874E-02	3.499E-04	1.784E 03	9.116E 04	3.210E 03
2000	1768	6.032E-19	2.166E-08	632.2	4.09	5.149E-02	1.879E-04	1.307E 03	8.430E 04	3.148E 03
2050	1768	5.520E-19	2.003E-08	646.5	4.05	3.006E-02	1.016E-04	9.607E 02	7.803E 04	3.088E 03

TIME (IN HOURS)= 15.000, COS(TH)= -7.0711E-01, INT GRAD= 1.6411E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	510	1.177E-11	1.851E-02	16.7	26.98	1.924E 11	3.584E 10	3.461E 10	1.564E 07	2.951E 04
140	655	5.354E-12	1.099E-02	21.9	26.56	8.677E 10	1.496E 10	1.972E 10	1.126E 07	2.253E 04
150	793	2.891E-12	7.281E-03	26.9	26.17	4.633E 10	7.505E 09	1.269E 10	8.738E 06	1.833E 04
160	919	1.748E-12	5.174E-03	31.7	25.82	2.766E 10	4.252E 09	8.870E 09	7.149E 06	1.560E 04
170	1032	1.144E-12	3.853E-03	36.2	25.48	1.786E 10	2.623E 09	6.573E 09	6.080E 06	1.374E 04
180	1131	7.940E-13	2.967E-03	40.3	25.16	1.220E 10	1.720E 09	5.085E 09	5.323E 06	1.241E 04
190	1216	5.751E-13	2.340E-03	44.0	24.85	8.696E 09	1.181E 09	4.059E 09	4.763E 06	1.143E 04
200	1290	4.304E-13	1.880E-03	47.4	24.55	6.398E 09	8.385E 08	3.321E 09	4.334E 06	1.068E 04
220	1407	2.589E-13	1.264E-03	53.3	23.97	3.708E 09	4.553E 08	2.342E 09	3.720E 06	9.631E 03
240	1493	1.665E-13	8.832E-04	58.3	23.40	2.287E 09	2.644E 08	1.732E 09	3.299E 06	8.940E 03
260	1556	1.120E-13	6.343E-04	62.6	22.84	1.469E 09	1.605E 08	1.321E 09	2.988E 06	8.454E 03
280	1603	7.786E-14	4.652E-04	66.4	22.31	9.707E 08	1.004E 08	1.029E 09	2.744E 06	8.094E 03
300	1638	5.549E-14	3.469E-04	69.9	21.79	6.543E 08	6.418E 07	8.137E 08	2.546E 06	7.816E 03
320	1664	4.034E-14	2.623E-04	73.1	21.28	4.476E 08	4.169E 07	6.503E 08	2.378E 06	7.593E 03
340	1684	2.980E-14	2.006E-04	76.2	20.80	3.096E 08	2.741E 07	5.240E 08	2.232E 06	7.408E 03
360	1699	2.233E-14	1.551E-04	79.1	20.34	2.160E 08	1.820E 07	4.249E 08	2.104E 06	7.249E 03
380	1711	1.692E-14	1.209E-04	81.8	19.91	1.517E 08	1.217E 07	3.461E 08	1.988E 06	7.110E 03
400	1720	1.296E-14	9.507E-05	84.5	19.51	1.072E 08	8.193E 06	2.831E 08	1.882E 06	6.986E 03
420	1728	1.003E-14	7.529E-05	87.0	19.13	7.612E 07	5.544E 06	2.323E 08	1.786E 06	6.873E 03
440	1733	7.820E-15	6.002E-05	89.5	18.78	5.427E 07	3.769E 06	1.912E 08	1.696E 06	6.768E 03
460	1738	6.147E-15	4.813E-05	91.8	18.45	3.883E 07	2.572E 06	1.577E 08	1.613E 06	6.670E 03
480	1742	4.866E-15	3.881E-05	94.1	18.15	2.787E 07	1.762E 06	1.303E 08	1.535E 06	6.578E 03
500	1745	3.877E-15	3.146E-05	96.2	17.88	2.007E 07	1.211E 06	1.079E 08	1.462E 06	6.490E 03
520	1747	3.108E-15	2.561E-05	98.3	17.63	1.449E 07	8.349E 05	8.949E 07	1.393E 06	6.405E 03
540	1749	2.505E-15	2.094E-05	100.3	17.40	1.048E 07	5.773E 05	7.434E 07	1.329E 06	6.324E 03
560	1751	2.029E-15	1.719E-05	102.3	17.18	7.605E 06	4.002E 05	6.185E 07	1.268E 06	6.246E 03
580	1752	1.651E-15	1.416E-05	104.1	16.98	5.530E 06	2.781E 05	5.152E 07	1.210E 06	6.170E 03
600	1753	1.349E-15	1.170E-05	105.9	16.80	4.030E 06	1.938E 05	4.298E 07	1.156E 06	6.096E 03
620	1754	1.106E-15	9.706E-06	107.7	16.63	2.943E 06	1.354E 05	3.590E 07	1.104E 06	6.025E 03
640	1755	9.107E-16	8.073E-06	109.5	16.46	2.153E 06	9.476E 04	3.002E 07	1.055E 06	5.955E 03
660	1756	7.522E-16	6.735E-06	111.2	16.31	1.579E 06	6.649E 04	2.513E 07	1.009E 06	5.886E 03
680	1757	6.231E-16	5.634E-06	112.9	16.15	1.160E 06	4.675E 04	2.106E 07	9.650E 05	5.820E 03
700	1757	5.177E-16	4.726E-06	114.7	16.01	8.536E 05	3.295E 04	1.767E 07	9.232E 05	5.754E 03
720	1758	4.313E-16	3.975E-06	116.4	15.86	6.294E 05	2.327E 04	1.484E 07	8.835E 05	5.690E 03

740	1758	3.602E-16	3.352E-06	118.2	15.71	4.650E 05	1.647E 04	1.248E 07	8.457E 05	5.627E 03
760	1758	3.015E-16	2.834E-06	120.1	15.56	3.441E 05	1.168E 04	1.051E 07	8.098E 05	5.566E 03
780	1759	2.530E-16	2.402E-06	122.0	15.40	2.551E 05	8.296E 03	8.853E 06	7.756E 05	5.506E 03
800	1759	2.127E-16	2.042E-06	124.0	15.24	1.894E 05	5.906E 03	7.467E 06	7.431E 05	5.446E 03
820	1759	1.792E-16	1.740E-06	126.1	15.07	1.409E 05	4.213E 03	6.304E 06	7.121E 05	5.388E 03
840	1759	1.513E-16	1.487E-06	128.3	14.89	1.050E 05	3.011E 03	5.328E 06	6.826E 05	5.331E 03
860	1759	1.280E-16	1.274E-06	130.7	14.70	7.838E 04	2.156E 03	4.507E 06	6.544E 05	5.275E 03
880	1760	1.085E-16	1.095E-06	133.3	14.50	5.860E 04	1.547E 03	3.816E 06	6.276E 05	5.220E 03
900	1760	9.215E-17	9.437E-07	136.0	14.29	4.389E 04	1.112E 03	3.234E 06	6.020E 05	5.166E 03
920	1760	7.841E-17	8.159E-07	139.0	14.06	3.292E 04	8.006E 02	2.743E 06	5.777E 05	5.112E 03
940	1760	6.685E-17	7.077E-07	142.2	13.82	2.473E 04	5.775E 02	2.329E 06	5.544E 05	5.060E 03
960	1760	5.711E-17	6.158E-07	145.6	13.57	1.861E 04	4.174E 02	1.979E 06	5.322E 05	5.008E 03
980	1760	4.888E-17	5.377E-07	149.3	13.30	1.402E 04	3.022E 02	1.684E 06	5.110E 05	4.958E 03
1000	1760	4.192E-17	4.711E-07	153.4	13.02	1.059E 04	2.191E 02	1.433E 06	4.907E 05	4.908E 03
1050	1760	2.882E-17	3.440E-07	165.1	12.26	5.274E 03	9.891E 01	9.623E 05	4.440E 05	4.787E 03
1100	1760	2.010E-17	2.572E-07	179.5	11.43	2.653E 03	4.512E 01	6.495E 05	4.023E 05	4.670E 03
1150	1760	1.423E-17	1.971E-07	196.8	10.57	1.346E 03	2.080E 01	4.407E 05	3.649E 05	4.557E 03
1200	1760	1.025E-17	1.547E-07	217.4	9.69	6.895E 02	9.687E 00	3.005E 05	3.315E 05	4.449E 03
1250	1760	7.516E-18	1.244E-07	241.5	8.84	3.562E 02	4.557E 00	2.060E 05	3.015E 05	4.345E 03
1300	1760	5.623E-18	1.022E-07	268.7	8.05	1.856E 02	2.165E 00	1.419E 05	2.745E 05	4.244E 03
1350	1760	4.295E-18	8.566E-08	298.7	7.34	9.754E 01	1.038E 00	9.817E 04	2.503E 05	4.147E 03
1400	1760	3.351E-18	7.306E-08	330.8	6.71	5.169E 01	5.027E-01	6.827E 04	2.285E 05	4.054E 03
1450	1760	2.671E-18	6.326E-08	363.9	6.18	2.761E 01	2.457E-01	4.769E 04	2.088E 05	3.964E 03
1500	1760	2.174E-18	5.547E-08	397.2	5.73	1.487E 01	1.212E-01	3.347E 04	1.910E 05	3.877E 03
1550	1760	1.803E-18	4.915E-08	429.6	5.37	8.069E 00	6.030E-02	2.360E 04	1.750E 05	3.792E 03
1600	1760	1.523E-18	4.392E-08	460.5	5.07	4.413E 00	3.027E-02	1.671E 04	1.604E 05	3.711E 03
1650	1760	1.306E-18	3.953E-08	489.3	4.83	2.431E 00	1.533E-02	1.188E 04	1.473E 05	3.632E 03
1700	1760	1.136E-18	3.579E-08	515.8	4.64	1.350E 00	7.825E-03	8.484E 03	1.353E 05	3.556E 03
1750	1760	9.992E-19	3.256E-08	539.8	4.49	7.546E-01	4.029E-03	6.084E 03	1.245E 05	3.483E 03
1800	1760	8.880E-19	2.973E-08	561.6	4.37	4.250E-01	2.091E-03	4.380E 03	1.146E 05	3.412E 03
1850	1760	7.956E-19	2.724E-08	581.4	4.27	2.410E-01	1.094E-03	3.166E 03	1.057E 05	3.343E 03
1900	1760	7.178E-19	2.503E-08	599.3	4.20	1.376E-01	5.769E-04	2.298E 03	9.749E 04	3.276E 03
1950	1760	6.513E-19	2.305E-08	615.7	4.13	7.909E-02	3.066E-04	1.674E 03	9.003E 04	3.212E 03
2000	1760	5.938E-19	2.127E-08	630.8	4.08	4.577E-02	1.641E-04	1.224E 03	8.323E 04	3.149E 03
2050	1760	5.435E-19	1.967E-08	644.8	4.04	2.666E-02	8.854E-05	8.986E 02	7.701E 04	3.089E 03

TIME (IN HOURS)= 16.000, COS(TH)= -5.0000E-01, INT GRAD= 1.6533E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	512	1.175E-11	1.853E-02	16.7	26.98	1.921E 11	3.578E 10	3.454E 10	1.560E 07	2.943E 04
140	657	5.352E-12	1.101E-02	21.9	26.56	8.675E 10	1.496E 10	1.969E 10	1.123E 07	2.246E 04
150	793	2.900E-12	7.305E-03	26.9	26.18	4.648E 10	7.533E 09	1.272E 10	8.740E 06	1.833E 04
160	916	1.759E-12	5.188E-03	31.6	25.82	2.783E 10	4.281E 09	8.915E 09	7.176E 06	1.566E 04
170	1025	1.154E-12	3.858E-03	36.0	25.48	1.800E 10	2.644E 09	6.622E 09	6.122E 06	1.383E 04
180	1120	8.007E-13	2.964E-03	39.9	25.16	1.230E 10	1.734E 09	5.129E 09	5.372E 06	1.253E 04
190	1203	5.797E-13	2.332E-03	43.5	24.85	8.763E 09	1.189E 09	4.097E 09	4.815E 06	1.156E 04
200	1273	4.333E-13	1.869E-03	46.8	24.54	6.438E 09	8.429E 08	3.352E 09	4.387E 06	1.082E 04
220	1386	2.597E-13	1.250E-03	52.5	23.95	3.714E 09	4.553E 08	2.360E 09	3.769E 06	9.772E 03
240	1469	1.662E-13	8.686E-04	57.4	23.37	2.278E 09	2.627E 08	1.740E 09	3.343E 06	9.079E 03
260	1530	1.113E-13	6.207E-04	61.6	22.81	1.455E 09	1.583E 08	1.323E 09	3.027E 06	8.588E 03
280	1576	7.698E-14	4.531E-04	65.4	22.26	9.552E 08	9.833E 07	1.027E 09	2.778E 06	8.224E 03
300	1610	5.461E-14	3.364E-04	68.9	21.73	6.398E 08	6.241E 07	8.092E 08	2.575E 06	7.940E 03
320	1636	3.952E-14	2.533E-04	72.1	21.22	4.349E 08	4.025E 07	6.444E 08	2.403E 06	7.712E 03
340	1656	2.907E-14	1.930E-04	75.1	20.73	2.989E 08	2.628E 07	5.174E 08	2.254E 06	7.521E 03
360	1671	2.169E-14	1.487E-04	78.0	20.27	2.073E 08	1.732E 07	4.180E 08	2.122E 06	7.358E 03
380	1683	1.638E-14	1.156E-04	80.8	19.83	1.448E 08	1.151E 07	3.394E 08	2.003E 06	7.214E 03
400	1692	1.251E-14	9.057E-05	83.4	19.43	1.017E 08	7.693E 06	2.766E 08	1.895E 06	7.085E 03
420	1699	9.641E-15	7.152E-05	85.9	19.05	7.177E 07	5.171E 06	2.262E 08	1.796E 06	6.968E 03
440	1705	7.498E-15	5.686E-05	88.4	18.70	5.088E 07	3.493E 06	1.855E 08	1.704E 06	6.860E 03
460	1710	5.877E-15	4.548E-05	90.7	18.37	3.620E 07	2.369E 06	1.525E 08	1.619E 06	6.758E 03
480	1714	4.640E-15	3.658E-05	93.0	18.08	2.584E 07	1.613E 06	1.257E 08	1.539E 06	6.663E 03
500	1717	3.688E-15	2.957E-05	95.1	17.80	1.850E 07	1.102E 06	1.037E 08	1.465E 06	6.572E 03
520	1719	2.949E-15	2.402E-05	97.2	17.55	1.329E 07	7.548E 05	8.577E 07	1.395E 06	6.485E 03
540	1722	2.371E-15	1.959E-05	99.2	17.32	9.566E 06	5.187E 05	7.103E 07	1.329E 06	6.401E 03
560	1723	1.916E-15	1.604E-05	101.1	17.11	6.904E 06	3.575E 05	5.892E 07	1.268E 06	6.320E 03
580	1725	1.555E-15	1.318E-05	102.9	16.91	4.994E 06	2.470E 05	4.894E 07	1.209E 06	6.242E 03
600	1726	1.268E-15	1.087E-05	104.7	16.73	3.621E 06	1.711E 05	4.070E 07	1.154E 06	6.166E 03
620	1727	1.038E-15	8.998E-06	106.5	16.56	2.631E 06	1.188E 05	3.390E 07	1.101E 06	6.092E 03
640	1728	8.523E-16	7.468E-06	108.2	16.40	1.916E 06	8.272E 04	2.826E 07	1.052E 06	6.020E 03
660	1729	7.024E-16	6.217E-06	109.9	16.24	1.398E 06	5.772E 04	2.360E 07	1.005E 06	5.950E 03
680	1729	5.807E-16	5.190E-06	111.7	16.08	1.022E 06	4.036E 04	1.972E 07	9.604E 05	5.881E 03
700	1730	4.814E-16	4.345E-06	113.4	15.93	7.483E 05	2.828E 04	1.650E 07	9.182E 05	5.814E 03
720	1730	4.001E-16	3.647E-06	115.2	15.78	5.491E 05	1.986E 04	1.382E 07	8.780E 05	5.749E 03

740	1731	3.334E-16	3.070E-06	117.0	15.63	4.037E 05	1.398E 04	1.159E 07	8.399E 05	5.684E 03
760	1731	2.785E-16	2.591E-06	118.8	15.47	2.973E 05	9.860E 03	9.730E 06	8.037E 05	5.621E 03
780	1731	2.332E-16	2.193E-06	120.8	15.31	2.194E 05	6.968E 03	8.176E 06	7.692E 05	5.559E 03
800	1732	1.957E-16	1.861E-06	122.9	15.14	1.622E 05	4.934E 03	6.877E 06	7.365E 05	5.498E 03
820	1732	1.645E-16	1.583E-06	125.0	14.96	1.201E 05	3.501E 03	5.791E 06	7.053E 05	5.439E 03
840	1732	1.386E-16	1.351E-06	127.3	14.77	8.906E 04	2.489E 03	4.881E 06	6.756E 05	5.380E 03
860	1732	1.170E-16	1.157E-06	129.8	14.57	6.617E 04	1.773E 03	4.118E 06	6.473E 05	5.323E 03
880	1732	9.901E-17	9.929E-07	132.5	14.36	4.925E 04	1.265E 03	3.478E 06	6.204E 05	5.266E 03
900	1732	8.393E-17	8.551E-07	135.3	14.14	3.671E 04	9.047E 02	2.940E 06	5.947E 05	5.210E 03
920	1732	7.129E-17	7.389E-07	138.4	13.90	2.741E 04	6.481E 02	2.487E 06	5.702E 05	5.156E 03
940	1732	6.067E-17	6.406E-07	141.8	13.64	2.050E 04	4.651E 02	2.106E 06	5.469E 05	5.102E 03
960	1733	5.174E-17	5.573E-07	145.4	13.37	1.536E 04	3.344E 02	1.785E 06	5.247E 05	5.049E 03
980	1733	4.422E-17	4.866E-07	149.4	13.09	1.152E 04	2.409E 02	1.515E 06	5.035E 05	4.998E 03
1000	1733	3.787E-17	4.264E-07	153.7	12.79	8.658E 03	1.738E 02	1.286E 06	4.832E 05	4.946E 03
1050	1733	2.595E-17	3.117E-07	166.2	11.99	4.267E 03	7.748E 01	8.582E 05	4.365E 05	4.822E 03
1100	1733	1.806E-17	2.337E-07	181.5	11.13	2.123E 03	3.491E 01	5.756E 05	3.949E 05	4.703E 03
1150	1733	1.277E-17	1.797E-07	199.9	10.24	1.066E 03	1.590E 01	3.882E 05	3.577E 05	4.588E 03
1200	1733	9.199E-18	1.417E-07	221.8	9.35	5.402E 02	7.315E 00	2.631E 05	3.244E 05	4.477E 03
1250	1733	6.756E-18	1.144E-07	247.1	8.51	2.762E 02	3.400E 00	1.793E 05	2.946E 05	4.371E 03
1300	1733	5.068E-18	9.444E-08	275.5	7.73	1.425E 02	1.597E 00	1.227E 05	2.678E 05	4.268E 03
1350	1733	3.886E-18	7.951E-08	306.4	7.04	7.411E 01	7.570E-01	8.446E 04	2.438E 05	4.169E 03
1400	1733	3.047E-18	6.809E-08	339.1	6.45	3.888E 01	3.624E-01	5.840E 04	2.223E 05	4.074E 03
1450	1733	2.442E-18	5.915E-08	372.3	5.95	2.056E 01	1.751E-01	4.057E 04	2.028E 05	3.982E 03
1500	1733	1.998E-18	5.201E-08	405.2	5.53	1.097E 01	8.541E-02	2.831E 04	1.853E 05	3.893E 03
1550	1733	1.667E-18	4.618E-08	436.7	5.20	5.894E 00	4.203E-02	1.985E 04	1.695E 05	3.807E 03
1600	1733	1.415E-18	4.134E-08	466.4	4.93	3.193E 00	2.087E-02	1.398E 04	1.552E 05	3.724E 03
1650	1733	1.220E-18	3.725E-08	493.7	4.72	1.743E 00	1.046E-02	9.886E 03	1.423E 05	3.644E 03
1700	1733	1.065E-18	3.375E-08	518.6	4.55	9.585E-01	5.282E-03	7.022E 03	1.306E 05	3.566E 03
1750	1733	9.404E-19	3.071E-08	541.1	4.41	5.311E-01	2.691E-03	5.009E 03	1.200E 05	3.492E 03
1800	1733	8.381E-19	2.805E-08	561.4	4.30	2.964E-01	1.383E-03	3.588E 03	1.103E 05	3.419E 03
1850	1733	7.526E-19	2.570E-08	579.8	4.22	1.666E-01	7.160E-04	2.581E 03	1.015E 05	3.349E 03
1900	1733	6.801E-19	2.360E-08	596.4	4.15	9.427E-02	3.738E-04	1.863E 03	9.358E 04	3.281E 03
1950	1733	6.179E-19	2.173E-08	611.7	4.10	5.372E-02	1.967E-04	1.351E 03	8.631E 04	3.216E 03
2000	1733	5.637E-19	2.004E-08	625.9	4.05	3.082E-02	1.043E-04	9.829E 02	7.969E 04	3.152E 03
2050	1733	5.162E-19	1.852E-08	639.1	4.02	1.780E-02	5.569E-05	7.180E 02	7.365E 04	3.091E 03

TIME (IN HOURS)= 17.000, COS(TH)= -2.5882E-01, INT GRAD= 1.6669E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	513	1.173E-11	1.855E-02	16.8	26.98	1.918E 11	3.574E 10	3.448E 10	1.556E 07	2.936E 04
140	658	5.357E-12	1.104E-02	21.9	26.56	8.683E 10	1.498E 10	1.969E 10	1.122E 07	2.244E 04
150	791	2.913E-12	7.318E-03	26.8	26.18	4.670E 10	7.571E 09	1.277E 10	8.767E 06	1.838E 04
160	909	1.773E-12	5.188E-03	31.4	25.82	2.805E 10	4.315E 09	8.987E 09	7.234E 06	1.579E 04
170	1012	1.165E-12	3.846E-03	35.5	25.48	1.817E 10	2.668E 09	6.695E 09	6.198E 06	1.401E 04
180	1101	8.084E-13	2.943E-03	39.3	25.15	1.242E 10	1.748E 09	5.193E 09	5.458E 06	1.274E 04
190	1179	5.843E-13	2.306E-03	42.7	24.83	8.826E 09	1.195E 09	4.150E 09	4.904E 06	1.179E 04
200	1245	4.356E-13	1.839E-03	45.8	24.52	6.464E 09	8.441E 08	3.392E 09	4.474E 06	1.106E 04
220	1352	2.592E-13	1.218E-03	51.3	23.91	3.698E 09	4.513E 08	2.379E 09	3.849E 06	1.001E 04
240	1431	1.645E-13	8.394E-04	56.0	23.31	2.245E 09	2.573E 08	1.745E 09	3.412E 06	9.307E 03
260	1490	1.092E-13	5.951E-04	60.2	22.74	1.418E 09	1.532E 08	1.319E 09	3.085E 06	8.803E 03
280	1535	7.493E-14	4.312E-04	64.0	22.17	9.214E 08	9.401E 07	1.018E 09	2.827E 06	8.425E 03
300	1568	5.275E-14	3.180E-04	67.4	21.63	6.108E 08	5.897E 07	7.969E 08	2.616E 06	8.130E 03
320	1594	3.791E-14	2.380E-04	70.6	21.11	4.110E 08	3.760E 07	6.309E 08	2.437E 06	7.891E 03
340	1614	2.771E-14	1.804E-04	73.7	20.61	2.798E 08	2.428E 07	5.037E 08	2.282E 06	7.691E 03
360	1629	2.056E-14	1.382E-04	76.5	20.14	1.922E 08	1.583E 07	4.047E 08	2.145E 06	7.520E 03
380	1641	1.544E-14	1.069E-04	79.3	19.70	1.330E 08	1.041E 07	3.268E 08	2.022E 06	7.369E 03
400	1650	1.173E-14	8.343E-05	81.9	19.29	9.257E 07	6.886E 06	2.650E 08	1.910E 06	7.234E 03
420	1658	9.002E-15	6.559E-05	84.4	18.91	6.477E 07	4.583E 06	2.156E 08	1.808E 06	7.111E 03
440	1663	6.970E-15	5.193E-05	86.8	18.56	4.551E 07	3.065E 06	1.759E 08	1.713E 06	6.998E 03
460	1668	5.442E-15	4.137E-05	89.1	18.24	3.211E 07	2.058E 06	1.439E 08	1.625E 06	6.892E 03
480	1672	4.280E-15	3.315E-05	91.3	17.95	2.273E 07	1.388E 06	1.180E 08	1.544E 06	6.792E 03
500	1675	3.389E-15	2.670E-05	93.4	17.68	1.614E 07	9.390E 05	9.694E 07	1.467E 06	6.697E 03
520	1678	2.700E-15	2.160E-05	95.5	17.43	1.149E 07	6.374E 05	7.977E 07	1.396E 06	6.606E 03
540	1680	2.163E-15	1.756E-05	97.4	17.21	8.207E 06	4.340E 05	6.576E 07	1.328E 06	6.518E 03
560	1682	1.742E-15	1.433E-05	99.3	17.00	5.876E 06	2.963E 05	5.429E 07	1.265E 06	6.434E 03
580	1683	1.409E-15	1.173E-05	101.1	16.80	4.216E 06	2.029E 05	4.489E 07	1.205E 06	6.353E 03
600	1684	1.145E-15	9.644E-06	102.9	16.62	3.033E 06	1.393E 05	3.717E 07	1.149E 06	6.274E 03
620	1685	9.337E-16	7.953E-06	104.6	16.45	2.186E 06	9.586E 04	3.081E 07	1.095E 06	6.197E 03
640	1686	7.643E-16	6.579E-06	106.3	16.29	1.579E 06	6.613E 04	2.558E 07	1.045E 06	6.122E 03
660	1687	6.277E-16	5.459E-06	108.0	16.13	1.143E 06	4.573E 04	2.126E 07	9.971E 05	6.048E 03
680	1688	5.171E-16	4.542E-06	109.7	15.97	8.293E 05	3.170E 04	1.769E 07	9.518E 05	5.977E 03
700	1688	4.272E-16	3.791E-06	111.5	15.82	6.028E 05	2.202E 04	1.473E 07	9.089E 05	5.907E 03
720	1689	3.539E-16	3.173E-06	113.3	15.66	4.389E 05	1.533E 04	1.229E 07	8.682E 05	5.839E 03

740	1689	2.939E-16	2.663E-06	115.1	15.50	3.203E 05	1.070E 04	1.026E 07	8.296E 05	5.772E 03
760	1689	2.447E-16	2.241E-06	117.0	15.33	2.341E 05	7.478E 03	8.575E 06	7.930E 05	5.706E 03
780	1690	2.042E-16	1.892E-06	119.1	15.16	1.714E 05	5.239E 03	7.175E 06	7.582E 05	5.641E 03
800	1690	1.707E-16	1.602E-06	121.2	14.98	1.258E 05	3.679E 03	6.009E 06	7.251E 05	5.578E 03
820	1690	1.431E-16	1.360E-06	123.5	14.78	9.244E 04	2.588E 03	5.039E 06	6.936E 05	5.516E 03
840	1690	1.202E-16	1.159E-06	125.9	14.58	6.806E 04	1.825E 03	4.229E 06	6.637E 05	5.455E 03
860	1690	1.012E-16	9.902E-07	128.6	14.36	5.020E 04	1.289E 03	3.553E 06	6.353E 05	5.396E 03
880	1690	8.532E-17	8.490E-07	131.4	14.12	3.709E 04	9.121E 02	2.988E 06	6.082E 05	5.337E 03
900	1690	7.211E-17	7.304E-07	134.5	13.88	2.745E 04	6.468E 02	2.515E 06	5.824E 05	5.279E 03
920	1691	6.108E-17	6.306E-07	137.9	13.61	2.035E 04	4.595E 02	2.119E 06	5.579E 05	5.223E 03
940	1691	5.184E-17	5.465E-07	141.6	13.33	1.511E 04	3.271E 02	1.787E 06	5.345E 05	5.167E 03
960	1691	4.410E-17	4.754E-07	145.6	13.04	1.124E 04	2.333E 02	1.509E 06	5.123E 05	5.112E 03
980	1691	3.760E-17	4.152E-07	149.9	12.73	8.370E 03	1.667E 02	1.275E 06	4.910E 05	5.058E 03
1000	1691	3.214E-17	3.641E-07	154.7	12.41	6.246E 03	1.193E 02	1.078E 06	4.708E 05	5.005E 03
1050	1691	2.193E-17	2.670E-07	168.5	11.55	3.025E 03	5.212E 01	7.123E 05	4.242E 05	4.877E 03
1100	1691	1.522E-17	2.011E-07	185.3	10.64	1.479E 03	2.303E 01	4.730E 05	3.828E 05	4.753E 03
1150	1691	1.076E-17	1.557E-07	205.7	9.71	7.301E 02	1.028E 01	3.159E 05	3.459E 05	4.634E 03
1200	1691	7.756E-18	1.236E-07	229.6	8.82	3.638E 02	4.642E 00	2.121E 05	3.130E 05	4.520E 03
1250	1691	5.717E-18	1.006E-07	256.8	7.99	1.829E 02	2.117E 00	1.431E 05	2.835E 05	4.409E 03
1300	1691	4.312E-18	8.368E-08	286.9	7.24	9.282E 01	9.755E-01	9.708E 04	2.572E 05	4.303E 03
1350	1691	3.330E-18	7.094E-08	319.0	6.60	4.751E 01	4.541E-01	6.618E 04	2.336E 05	4.201E 03
1400	1691	2.633E-18	6.111E-08	352.1	6.06	2.453E 01	2.134E-01	4.534E 04	2.124E 05	4.102E 03
1450	1691	2.130E-18	5.335E-08	385.0	5.61	1.277E 01	1.013E-01	3.122E 04	1.934E 05	4.007E 03
1500	1691	1.759E-18	4.709E-08	416.7	5.25	6.706E 00	4.854E-02	2.159E 04	1.763E 05	3.916E 03
1550	1691	1.481E-18	4.194E-08	446.5	4.96	3.549E 00	2.347E-02	1.501E 04	1.609E 05	3.827E 03
1600	1691	1.267E-18	3.762E-08	473.9	4.73	1.894E 00	1.146E-02	1.048E 04	1.470E 05	3.742E 03
1650	1691	1.100E-18	3.395E-08	498.8	4.55	1.018E 00	5.641E-03	7.346E 03	1.345E 05	3.659E 03
1700	1691	9.664E-19	3.078E-08	521.2	4.41	5.518E-01	2.802E-03	5.174E 03	1.232E 05	3.580E 03
1750	1691	8.575E-19	2.802E-08	541.3	4.30	3.013E-01	1.404E-03	3.660E 03	1.129E 05	3.503E 03
1800	1691	7.671E-19	2.558E-08	559.4	4.21	1.657E-01	7.094E-04	2.600E 03	1.036E 05	3.428E 03
1850	1691	6.909E-19	2.343E-08	575.8	4.15	9.182E-02	3.615E-04	1.855E 03	9.520E 04	3.356E 03
1900	1691	6.256E-19	2.150E-08	590.7	4.09	5.124E-02	1.857E-04	1.329E 03	8.754E 04	3.287E 03
1950	1691	5.691E-19	1.978E-08	604.5	4.05	2.879E-02	9.615E-05	9.554E 02	8.059E 04	3.220E 03
2000	1691	5.197E-19	1.822E-08	617.3	4.01	1.629E-02	5.018E-05	6.898E 02	7.426E 04	3.154E 03
2050	1691	4.760E-19	1.682E-08	629.5	3.98	9.282E-03	2.639E-05	5.000E 02	6.849E 04	3.091E 03

TIME (IN HOURS)= 18.000, COS(TH)= -1.2703E-06, INT GRAD= 1.6811E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	514	1.172E-11	1.856E-02	16.8	26.98	1.916E 11	3.570E 10	3.443E 10	1.553E 07	2.930E 04
140	658	5.366E-12	1.105E-02	21.9	26.56	8.698E 10	1.501E 10	1.971E 10	1.122E 07	2.244E 04
150	787	2.929E-12	7.322E-03	26.7	26.18	4.695E 10	7.612E 09	1.283E 10	8.809E 06	1.847E 04
160	900	1.787E-12	5.178E-03	31.1	25.82	2.827E 10	4.348E 09	9.066E 09	7.303E 06	1.594E 04
170	997	1.176E-12	3.825E-03	35.0	25.47	1.833E 10	2.690E 09	6.773E 09	6.287E 06	1.422E 04
180	1080	8.159E-13	2.913E-03	38.5	25.14	1.252E 10	1.761E 09	5.263E 09	5.559E 06	1.299E 04
190	1150	5.890E-13	2.270E-03	41.7	24.81	8.888E 09	1.201E 09	4.210E 09	5.013E 06	1.207E 04
200	1210	4.382E-13	1.800E-03	44.6	24.49	6.490E 09	8.446E 08	3.441E 09	4.587E 06	1.136E 04
220	1305	2.589E-13	1.178E-03	49.6	23.86	3.680E 09	4.466E 08	2.408E 09	3.963E 06	1.035E 04
240	1375	1.628E-13	8.009E-04	54.0	23.24	2.207E 09	2.510E 08	1.758E 09	3.521E 06	9.664E 03
260	1427	1.069E-13	5.603E-04	57.9	22.63	1.375E 09	1.469E 08	1.320E 09	3.187E 06	9.167E 03
280	1466	7.247E-14	4.008E-04	61.5	22.04	8.791E 08	8.853E 07	1.010E 09	2.920E 06	8.789E 03
300	1496	5.041E-14	2.920E-04	64.8	21.48	5.730E 08	5.446E 07	7.841E 08	2.700E 06	8.490E 03
320	1518	3.580E-14	2.159E-04	67.8	20.93	3.789E 08	3.403E 07	6.149E 08	2.511E 06	8.245E 03
340	1536	2.587E-14	1.618E-04	70.8	20.42	2.534E 08	2.153E 07	4.861E 08	2.347E 06	8.038E 03
360	1549	1.898E-14	1.226E-04	73.5	19.94	1.709E 08	1.375E 07	3.866E 08	2.202E 06	7.859E 03
380	1560	1.411E-14	9.388E-05	76.2	19.49	1.161E 08	8.853E 06	3.091E 08	2.071E 06	7.700E 03
400	1568	1.061E-14	7.253E-05	78.8	19.07	7.939E 07	5.737E 06	2.481E 08	1.952E 06	7.557E 03
420	1575	8.061E-15	5.648E-05	81.2	18.69	5.455E 07	3.740E 06	1.998E 08	1.843E 06	7.426E 03
440	1580	6.184E-15	4.430E-05	83.5	18.34	3.764E 07	2.449E 06	1.613E 08	1.742E 06	7.304E 03
460	1584	4.784E-15	3.497E-05	85.7	18.02	2.608E 07	1.611E 06	1.306E 08	1.649E 06	7.190E 03
480	1588	3.730E-15	2.777E-05	87.8	17.73	1.813E 07	1.064E 06	1.060E 08	1.562E 06	7.082E 03
500	1590	2.928E-15	2.217E-05	89.8	17.46	1.264E 07	7.053E 05	8.619E 07	1.481E 06	6.979E 03
520	1593	2.313E-15	1.779E-05	91.8	17.22	8.843E 06	4.690E 05	7.021E 07	1.405E 06	6.880E 03
540	1595	1.838E-15	1.434E-05	93.6	17.00	6.203E 06	3.129E 05	5.729E 07	1.334E 06	6.785E 03
560	1596	1.468E-15	1.160E-05	95.4	16.79	4.362E 06	2.094E 05	4.682E 07	1.267E 06	6.693E 03
580	1598	1.178E-15	9.425E-06	97.1	16.60	3.076E 06	1.405E 05	3.832E 07	1.204E 06	6.604E 03
600	1599	9.493E-16	7.685E-06	98.8	16.42	2.174E 06	9.453E 04	3.141E 07	1.145E 06	6.518E 03
620	1600	7.681E-16	6.288E-06	100.5	16.25	1.540E 06	6.377E 04	2.578E 07	1.089E 06	6.434E 03
640	1601	6.237E-16	5.162E-06	102.2	16.08	1.093E 06	4.313E 04	2.119E 07	1.036E 06	6.352E 03
660	1601	5.082E-16	4.251E-06	103.9	15.91	7.779E 05	2.924E 04	1.744E 07	9.863E 05	6.272E 03
680	1602	4.153E-16	3.513E-06	105.6	15.75	5.547E 05	1.988E 04	1.437E 07	9.392E 05	6.194E 03
700	1603	3.404E-16	2.911E-06	107.4	15.58	3.964E 05	1.354E 04	1.185E 07	8.947E 05	6.117E 03
720	1603	2.798E-16	2.421E-06	109.3	15.41	2.838E 05	9.248E 03	9.790E 06	8.525E 05	6.042E 03

740	1604	2.306E-16	2.019E-06	111.2	15.23	2.036E 05	6.330E 03	8.095E 06	8.126E 05	5.969E 03
760	1604	1.905E-16	1.690E-06	113.3	15.04	1.464E 05	4.342E 03	6.702E 06	7.749E 05	5.898E 03
780	1604	1.578E-16	1.419E-06	115.5	14.83	1.054E 05	2.985E 03	5.555E 06	7.391E 05	5.828E 03
800	1605	1.310E-16	1.195E-06	117.9	14.62	7.609E 04	2.057E 03	4.609E 06	7.051E 05	5.759E 03
820	1605	1.090E-16	1.011E-06	120.5	14.39	5.501E 04	1.420E 03	3.828E 06	6.730E 05	5.691E 03
840	1605	9.088E-17	8.576E-07	123.3	14.14	3.985E 04	9.829E 02	3.183E 06	6.424E 05	5.625E 03
860	1605	7.597E-17	7.306E-07	126.3	13.88	2.892E 04	6.816E 02	2.650E 06	6.135E 05	5.560E 03
880	1605	6.366E-17	6.249E-07	129.7	13.60	2.103E 04	4.736E 02	2.208E 06	5.860E 05	5.496E 03
900	1605	5.347E-17	5.367E-07	133.3	13.30	1.531E 04	3.298E 02	1.842E 06	5.598E 05	5.434E 03
920	1605	4.502E-17	4.630E-07	137.3	12.98	1.117E 04	2.301E 02	1.538E 06	5.350E 05	5.372E 03
940	1606	3.800E-17	4.011E-07	141.7	12.65	8.167E 03	1.609E 02	1.285E 06	5.115E 05	5.312E 03
960	1606	3.216E-17	3.491E-07	146.6	12.30	5.979E 03	1.127E 02	1.075E 06	4.890E 05	5.253E 03
980	1606	2.730E-17	3.053E-07	151.8	11.93	4.385E 03	7.908E 01	9.006E 05	4.677E 05	5.195E 03
1000	1606	2.323E-17	2.683E-07	157.6	11.56	3.222E 03	5.561E 01	7.550E 05	4.475E 05	5.137E 03
1050	1606	1.573E-17	1.984E-07	174.4	10.59	1.501E 03	2.325E 01	4.878E 05	4.010E 05	4.998E 03
1100	1606	1.088E-17	1.512E-07	194.9	9.60	7.069E 02	9.838E 00	3.170E 05	3.599E 05	4.865E 03
1150	1606	7.696E-18	1.187E-07	219.2	8.66	3.361E 02	4.210E 00	2.072E 05	3.234E 05	4.737E 03
1200	1606	5.583E-18	9.573E-08	246.9	7.78	1.614E 02	1.822E 00	1.362E 05	2.911E 05	4.614E 03
1250	1606	4.158E-18	7.908E-08	277.5	7.02	7.827E 01	7.970E-01	9.002E 04	2.623E 05	4.495E 03
1300	1606	3.182E-18	6.669E-08	309.9	6.37	3.831E 01	3.525E-01	5.982E 04	2.367E 05	4.381E 03
1350	1606	2.500E-18	5.720E-08	342.7	5.83	1.893E 01	1.576E-01	3.996E 04	2.139E 05	4.272E 03
1400	1606	2.014E-18	4.976E-08	374.8	5.40	9.435E 00	7.116E-02	2.684E 04	1.936E 05	4.166E 03
1450	1606	1.660E-18	4.377E-08	405.1	5.06	4.746E 00	3.246E-02	1.811E 04	1.754E 05	4.065E 03
1500	1606	1.396E-18	3.885E-08	433.1	4.80	2.408E 00	1.496E-02	1.229E 04	1.591E 05	3.967E 03
1550	1606	1.194E-18	3.473E-08	458.3	4.59	1.232E 00	6.961E-03	8.376E 03	1.445E 05	3.873E 03
1600	1606	1.037E-18	3.122E-08	480.8	4.43	6.359E-01	3.271E-03	5.737E 03	1.314E 05	3.782E 03
1650	1606	9.103E-19	2.820E-08	500.7	4.31	3.309E-01	1.551E-03	3.948E 03	1.196E 05	3.694E 03
1700	1606	8.070E-19	2.556E-08	518.4	4.21	1.736E-01	7.425E-04	2.730E 03	1.090E 05	3.609E 03
1750	1606	7.209E-19	2.325E-08	534.3	4.14	9.178E-02	3.586E-04	1.896E 03	9.949E 04	3.528E 03
1800	1606	6.481E-19	2.120E-08	548.6	4.08	4.891E-02	1.748E-04	1.323E 03	9.089E 04	3.449E 03
1850	1606	5.856E-19	1.937E-08	561.7	4.04	2.626E-02	8.593E-05	9.267E 02	8.313E 04	3.373E 03
1900	1606	5.312E-19	1.774E-08	573.9	4.00	1.421E-02	4.261E-05	6.522E 02	7.611E 04	3.299E 03
1950	1606	4.836E-19	1.627E-08	585.3	3.97	7.745E-03	2.131E-05	4.609E 02	6.975E 04	3.228E 03
2000	1606	4.415E-19	1.495E-08	596.3	3.94	4.252E-03	1.074E-05	3.271E 02	6.399E 04	3.159E 03
2050	1606	4.040E-19	1.376E-08	606.8	3.92	2.351E-03	5.462E-06	2.330E 02	5.877E 04	3.093E 03

TIME (IN HOURS)= 19.000, COS(TH)= 2.5882E-01, INT GRAD= 1.6947E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	515	1.171E-11	1.858E-02	16.8	26.98	1.915E 11	3.569E 10	3.440E 10	1.551E 07	2.926E 04
140	657	5.377E-12	1.106E-02	21.9	26.56	8.717E 10	1.504E 10	1.975E 10	1.123E 07	2.247E 04
150	783	2.944E-12	7.319E-03	26.6	26.18	4.720E 10	7.652E 09	1.290E 10	8.859E 06	1.858E 04
160	890	1.800E-12	5.161E-03	30.7	25.82	2.848E 10	4.377E 09	9.146E 09	7.380E 06	1.611E 04
170	981	1.185E-12	3.797E-03	34.4	25.47	1.848E 10	2.708E 09	6.849E 09	6.380E 06	1.444E 04
180	1058	8.222E-13	2.878E-03	37.7	25.12	1.261E 10	1.769E 09	5.331E 09	5.663E 06	1.325E 04
190	1122	5.927E-13	2.230E-03	40.7	24.79	8.930E 09	1.203E 09	4.267E 09	5.124E 06	1.256E 04
200	1176	4.398E-13	1.758E-03	43.4	24.46	6.500E 09	8.427E 08	3.487E 09	4.702E 06	1.168E 04
220	1259	2.580E-13	1.135E-03	48.0	23.80	3.652E 09	4.406E 08	2.435E 09	4.082E 06	1.071E 04
240	1319	1.607E-13	7.611E-04	52.0	23.15	2.165E 09	2.440E 08	1.770E 09	3.640E 06	1.006E 04
260	1361	1.044E-13	5.247E-04	55.5	22.52	1.329E 09	1.404E 08	1.321E 09	3.303E 06	9.586E 03
280	1391	6.998E-14	3.697E-04	58.7	21.90	8.557E 08	8.293E 07	1.004E 09	3.032E 06	9.228E 03
300	1414	4.806E-14	2.652E-04	61.7	21.30	5.346E 08	4.991E 07	7.720E 08	2.805E 06	8.943E 03
320	1430	3.368E-14	1.932E-04	64.5	20.73	3.464E 08	3.045E 07	5.995E 08	2.610E 06	8.708E 03
340	1442	2.401E-14	1.426E-04	67.2	20.20	2.266E 08	1.878E 07	4.685E 08	2.438E 06	8.507E 03
360	1451	1.737E-14	1.064E-04	69.7	19.70	1.494E 08	1.168E 07	3.681E 08	2.284E 06	8.330E 03
380	1458	1.274E-14	8.030E-05	72.2	19.23	9.909E 07	7.314E 06	2.905E 08	2.144E 06	8.170E 03
400	1464	9.449E-15	6.114E-05	74.5	18.81	6.607E 07	4.607E 06	2.300E 08	2.017E 06	8.024E 03
420	1468	7.084E-15	4.694E-05	76.8	18.42	4.425E 07	2.916E 06	1.827E 08	1.899E 06	7.888E 03
440	1471	5.363E-15	3.630E-05	78.9	18.07	2.976E 07	1.854E 06	1.454E 08	1.791E 06	7.760E 03
460	1473	4.094E-15	2.826E-05	80.9	17.75	2.008E 07	1.183E 06	1.160E 08	1.690E 06	7.638E 03
480	1475	3.151E-15	2.214E-05	82.9	17.46	1.359E 07	7.581E 05	9.277E 07	1.596E 06	7.522E 03
500	1477	2.442E-15	1.744E-05	84.7	17.20	9.230E 06	4.873E 05	7.431E 07	1.508E 06	7.410E 03
520	1478	1.904E-15	1.380E-05	86.5	16.96	6.285E 06	3.143E 05	5.962E 07	1.426E 06	7.302E 03
540	1480	1.494E-15	1.098E-05	88.2	16.74	4.292E 06	2.033E 05	4.792E 07	1.349E 06	7.197E 03
560	1481	1.178E-15	8.769E-06	89.8	16.54	2.938E 06	1.319E 05	3.857E 07	1.277E 06	7.096E 03
580	1481	9.333E-16	7.033E-06	91.5	16.34	2.016E 06	8.581E 04	3.109E 07	1.209E 06	6.997E 03
600	1482	7.426E-16	5.663E-06	93.1	16.16	1.387E 06	5.598E 04	2.509E 07	1.145E 06	6.901E 03
620	1483	5.932E-16	4.576E-06	94.7	15.98	9.564E 05	3.662E 04	2.028E 07	1.085E 06	6.807E 03
640	1483	4.756E-16	3.712E-06	96.4	15.80	6.610E 05	2.402E 04	1.642E 07	1.029E 06	6.715E 03
660	1483	3.826E-16	3.022E-06	98.1	15.61	4.579E 05	1.579E 04	1.331E 07	9.760E 05	6.625E 03
680	1484	3.087E-16	2.469E-06	99.9	15.43	3.179E 05	1.041E 04	1.080E 07	9.259E 05	6.537E 03
700	1484	2.499E-16	2.025E-06	101.8	15.23	2.212E 05	6.880E 03	8.773E 06	8.787E 05	6.451E 03
720	1484	2.028E-16	1.667E-06	103.8	15.02	1.542E 05	4.558E 03	7.137E 06	8.342E 05	6.367E 03

740	1485	1.651E-16	1.377E-06	106.0	14.80	1.077E 05	3.027E 03	5.814E 06	7.923E 05	6.285E 03
760	1485	1.348E-16	1.143E-06	108.3	14.56	7.544E 04	2.015E 03	4.741E 06	7.526E 05	6.204E 03
780	1485	1.103E-16	9.522E-07	110.9	14.30	5.293E 04	1.344E 03	3.871E 06	7.152E 05	6.125E 03
800	1485	9.050E-17	7.969E-07	113.8	14.02	3.721E 04	8.990E 02	3.164E 06	6.798E 05	6.047E 03
820	1485	7.446E-17	6.700E-07	116.9	13.72	2.621E 04	6.026E 02	2.589E 06	6.464E 05	5.971E 03
840	1485	6.143E-17	5.660E-07	120.4	13.40	1.850E 04	4.048E 02	2.122E 06	6.148E 05	5.896E 03
860	1486	5.083E-17	4.806E-07	124.2	13.06	1.309E 04	2.726E 02	1.740E 06	5.849E 05	5.823E 03
880	1486	4.218E-17	4.102E-07	128.5	12.70	9.274E 03	1.839E 02	1.429E 06	5.567E 05	5.751E 03
900	1486	3.511E-17	3.520E-07	133.2	12.32	6.584E 03	1.244E 02	1.175E 06	5.299E 05	5.681E 03
920	1486	2.932E-17	3.038E-07	138.4	11.92	4.684E 03	8.432E 01	9.667E 05	5.046E 05	5.611E 03
940	1486	2.456E-17	2.637E-07	144.2	11.51	3.338E 03	5.727E 01	7.964E 05	4.806E 05	5.543E 03
960	1486	2.065E-17	2.302E-07	150.5	11.08	2.383E 03	3.898E 01	6.568E 05	4.579E 05	5.477E 03
980	1486	1.743E-17	2.021E-07	157.4	10.65	1.705E 03	2.659E 01	5.423E 05	4.364E 05	5.411E 03
1000	1486	1.477E-17	1.785E-07	165.0	10.22	1.222E 03	1.818E 01	4.482E 05	4.160E 05	5.347E 03
1050	1486	9.938E-18	1.343E-07	186.9	9.14	5.354E 02	7.084E 00	2.795E 05	3.695E 05	5.191E 03
1100	1486	6.883E-18	1.045E-07	212.8	8.14	2.372E 02	2.796E 00	1.755E 05	3.287E 05	5.041E 03
1150	1486	4.918E-18	8.381E-08	242.2	7.25	1.062E 02	1.117E 00	1.108E 05	2.929E 05	4.898E 03
1200	1486	3.630E-18	6.902E-08	273.8	6.50	4.809E 01	4.520E-01	7.043E 04	2.614E 05	4.760E 03
1250	1486	2.767E-18	5.808E-08	306.3	5.88	2.199E 01	1.850E-01	4.502E 04	2.336E 05	4.628E 03
1300	1486	2.175E-18	4.973E-08	338.1	5.40	1.016E 01	7.662E-02	2.895E 04	2.091E 05	4.502E 03
1350	1486	1.757E-18	4.316E-08	367.9	5.03	4.743E 00	3.209E-02	1.872E 04	1.874E 05	4.380E 03
1400	1486	1.455E-18	3.786E-08	394.9	4.75	2.236E 00	1.359E-02	1.217E 04	1.682E 05	4.263E 03
1450	1486	1.229E-18	3.348E-08	418.8	4.53	1.064E 00	5.822E-03	7.960E 03	1.512E 05	4.151E 03
1500	1486	1.055E-18	2.980E-08	439.7	4.37	5.111E-01	2.520E-03	5.233E 03	1.361E 05	4.043E 03
1550	1486	9.178E-19	2.666E-08	457.9	4.25	2.478E-01	1.103E-03	3.459E 03	1.226E 05	3.940E 03
1600	1486	8.068E-19	2.395E-08	473.9	4.16	1.212E-01	4.874E-04	2.298E 03	1.107E 05	3.840E 03
1650	1486	7.150E-19	2.158E-08	487.9	4.09	5.985E-02	2.177E-04	1.535E 03	9.999E 04	3.744E 03
1700	1486	6.378E-19	1.951E-08	500.6	4.04	2.980E-02	9.819E-05	1.030E 03	9.046E 04	3.651E 03
1750	1486	5.718E-19	1.767E-08	512.2	4.00	1.497E-02	4.473E-05	6.945E 02	8.194E 04	3.562E 03
1800	1486	5.147E-19	1.605E-08	522.9	3.96	7.583E-03	2.057E-05	4.707E 02	7.431E 04	3.476E 03
1850	1486	4.649E-19	1.460E-08	533.1	3.93	3.873E-03	9.551E-06	3.205E 02	6.747E 04	3.393E 03
1900	1486	4.211E-19	1.330E-08	542.9	3.91	1.994E-03	4.476E-06	2.192E 02	6.134E 04	3.313E 03
1950	1486	3.823E-19	1.214E-08	552.4	3.89	1.035E-03	2.116E-06	1.507E 02	5.582E 04	3.236E 03
2000	1486	3.478E-19	1.110E-08	561.8	3.87	5.414E-04	1.010E-06	1.040E 02	5.086E 04	3.162E 03
2050	1486	3.170E-19	1.016E-08	571.1	3.85	2.854E-04	4.861E-07	7.210E 01	4.639E 04	3.090E 03

TIME (IN HOURS)= 20.000, COS(TH)= 5.0000E-01, INT GRAD= 1.7067E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	515	1.171E-11	1.859E-02	16.9	26.98	1.915E 11	3.568E 10	3.438E 10	1.550E 07	2.924E 04
140	656	5.391E-12	1.107E-02	21.9	26.56	8.740E 10	1.508E 10	1.979E 10	1.126E 07	2.252E 04
150	777	2.960E-12	7.308E-03	26.4	26.18	4.745E 10	7.691E 09	1.298E 10	8.919E 06	1.870E 04
160	880	1.813E-12	5.136E-03	30.4	25.81	2.867E 10	4.404E 09	9.228E 09	7.462E 06	1.630E 04
170	965	1.194E-12	3.763E-03	33.9	25.45	1.860E 10	2.722E 09	6.925E 09	6.478E 06	1.468E 04
180	1036	8.272E-13	2.838E-03	37.0	25.11	1.268E 10	1.775E 09	5.395E 09	5.770E 06	1.352E 04
190	1094	5.951E-13	2.187E-03	39.7	24.76	8.953E 09	1.202E 09	4.319E 09	5.236E 06	1.267E 04
200	1143	4.403E-13	1.713E-03	42.2	24.42	6.493E 09	8.382E 08	3.528E 09	4.818E 06	1.201E 04
220	1216	2.563E-13	1.092E-03	46.5	23.74	3.612E 09	4.328E 08	2.456E 09	4.199E 06	1.107E 04
240	1267	1.580E-13	7.217E-04	50.1	23.06	2.113E 09	2.360E 08	1.776E 09	3.754E 06	1.044E 04
260	1302	1.015E-13	4.905E-04	53.4	22.40	1.277E 09	1.333E 08	1.316E 09	3.411E 06	9.990E 03
280	1327	6.718E-14	3.407E-04	56.4	21.75	7.891E 08	7.715E 07	9.912E 08	3.132E 06	9.642E 03
300	1344	4.555E-14	2.409E-04	59.1	21.13	4.953E 08	4.541E 07	7.551E 08	2.897E 06	9.362E 03
320	1357	3.151E-14	1.731E-04	61.8	20.54	3.145E 08	2.707E 07	5.800E 08	2.692E 06	9.127E 03
340	1366	2.217E-14	1.260E-04	64.3	19.98	2.015E 08	1.629E 07	4.482E 08	2.510E 06	8.924E 03
360	1373	1.584E-14	9.290E-05	66.8	19.47	1.300E 08	9.883E 06	3.480E 08	2.347E 06	8.742E 03
380	1378	1.147E-14	6.920E-05	69.1	19.00	8.430E 07	6.033E 06	2.713E 08	2.199E 06	8.577E 03
400	1382	8.408E-15	5.204E-05	71.3	18.57	5.495E 07	3.702E 06	2.121E 08	2.065E 06	8.423E 03
420	1385	6.231E-15	3.947E-05	73.4	18.18	3.597E 07	2.283E 06	1.663E 08	1.937E 06	8.279E 03
440	1387	4.663E-15	3.017E-05	75.4	17.83	2.363E 07	1.413E 06	1.307E 08	1.821E 06	8.142E 03
460	1389	3.521E-15	2.322E-05	77.3	17.51	1.558E 07	8.785E 05	1.029E 08	1.714E 06	8.011E 03
480	1391	2.679E-15	1.798E-05	79.1	17.23	1.031E 07	5.480E 05	8.122E 07	1.613E 06	7.885E 03
500	1392	2.054E-15	1.400E-05	80.9	16.97	6.837E 06	3.430E 05	6.420E 07	1.520E 06	7.763E 03
520	1393	1.585E-15	1.096E-05	82.5	16.74	4.548E 06	2.154E 05	5.083E 07	1.433E 06	7.645E 03
540	1394	1.230E-15	8.624E-06	84.2	16.52	3.034E 06	1.357E 05	4.031E 07	1.351E 06	7.530E 03
560	1394	9.592E-16	6.815E-06	85.8	16.32	2.029E 06	8.571E 04	3.202E 07	1.275E 06	7.419E 03
580	1395	7.518E-16	5.409E-06	87.3	16.12	1.361E 06	5.431E 04	2.547E 07	1.203E 06	7.310E 03
600	1395	5.918E-16	4.311E-06	88.9	15.93	9.148E 05	3.451E 04	2.029E 07	1.136E 06	7.204E 03
620	1396	4.677E-16	3.450E-06	90.6	15.73	6.165E 05	2.199E 04	1.619E 07	1.073E 06	7.101E 03
640	1396	3.709E-16	2.772E-06	92.3	15.54	4.164E 05	1.405E 04	1.293E 07	1.014E 06	7.000E 03
660	1397	2.952E-16	2.236E-06	94.1	15.33	2.820E 05	9.002E 03	1.035E 07	9.586E 05	6.901E 03
680	1397	2.358E-16	1.812E-06	96.0	15.11	1.914E 05	5.782E 03	8.289E 06	9.065E 05	6.804E 03
700	1397	1.888E-16	1.474E-06	98.1	14.88	1.302E 05	3.724E 03	6.649E 06	8.576E 05	6.709E 03
720	1397	1.517E-16	1.205E-06	100.3	14.63	8.875E 04	2.405E 03	5.340E 06	8.115E 05	6.617E 03

740	1398	1.223E-16	9.896E-07	102.8	14.36	6.065E 04	1.557E 03	4.294E 06	7.682E 05	6.526E 03
760	1398	9.884E-17	8.167E-07	105.6	14.06	4.153E 04	1.010E 03	3.458E 06	7.275E 05	6.437E 03
780	1398	8.013E-17	6.776E-07	108.6	13.74	2.850E 04	6.573E 02	2.788E 06	6.891E 05	6.350E 03
800	1398	6.517E-17	5.652E-07	112.0	13.40	1.960E 04	4.287E 02	2.250E 06	6.530E 05	6.264E 03
820	1398	5.317E-17	4.742E-07	115.9	13.03	1.351E 04	2.803E 02	1.819E 06	6.190E 05	6.181E 03
840	1398	4.352E-17	4.002E-07	120.1	12.64	9.332E 03	1.837E 02	1.472E 06	5.869E 05	6.099E 03
860	1398	3.575E-17	3.399E-07	124.9	12.23	6.459E 03	1.207E 02	1.192E 06	5.566E 05	6.018E 03
880	1398	2.948E-17	2.906E-07	130.2	11.79	4.480E 03	7.946E 01	9.672E 05	5.281E 05	5.939E 03
900	1398	2.440E-17	2.500E-07	136.1	11.35	3.113E 03	5.244E 01	7.854E 05	5.012E 05	5.862E 03
920	1398	2.028E-17	2.166E-07	142.7	10.88	2.168E 03	3.469E 01	6.386E 05	4.758E 05	5.786E 03
940	1399	1.692E-17	1.889E-07	149.9	10.42	1.513E 03	2.300E 01	5.198E 05	4.518E 05	5.712E 03
960	1399	1.419E-17	1.659E-07	157.8	9.95	1.058E 03	1.529E 01	4.235E 05	4.292E 05	5.639E 03
980	1399	1.196E-17	1.466E-07	166.4	9.49	7.410E 02	1.018E 01	3.455E 05	4.078E 05	5.567E 03
1000	1399	1.013E-17	1.304E-07	175.8	9.03	5.201E 02	6.796E 00	2.822E 05	3.875E 05	5.497E 03
1050	1399	6.848E-18	1.000E-07	202.1	7.96	2.165E 02	2.497E 00	1.709E 05	3.417E 05	5.326E 03
1100	1399	4.801E-18	7.937E-08	231.8	7.03	9.116E 01	9.302E-01	1.042E 05	3.018E 05	5.163E 03
1150	1399	3.495E-18	6.484E-08	263.7	6.27	3.883E 01	3.511E-01	6.396E 04	2.670E 05	5.008E 03
1200	1399	2.640E-18	5.422E-08	295.8	5.66	1.673E 01	1.342E-01	3.951E 04	2.365E 05	4.858E 03
1250	1399	2.064E-18	4.617E-08	326.4	5.20	7.288E 00	5.196E-02	2.456E 04	2.099E 05	4.716E 03
1300	1399	1.663E-18	3.986E-08	354.4	4.85	3.209E 00	2.036E-02	1.536E 04	1.866E 05	4.579E 03
1350	1399	1.374E-18	3.478E-08	379.1	4.59	1.428E 00	8.079E-03	9.668E 03	1.661E 05	4.447E 03
1400	1399	1.159E-18	3.060E-08	400.4	4.41	6.423E-01	3.244E-03	6.121E 03	1.481E 05	4.322E 03
1450	1399	9.939E-19	2.708E-08	418.7	4.27	2.918E-01	1.318E-03	3.898E 03	1.322E 05	4.201E 03
1500	1399	8.630E-19	2.409E-08	434.5	4.17	1.339E-01	5.414E-04	2.496E 03	1.182E 05	4.085E 03
1550	1399	7.565E-19	2.151E-08	448.1	4.09	6.206E-02	2.249E-04	1.608E 03	1.059E 05	3.974E 03
1600	1399	6.682E-19	1.927E-08	460.3	4.03	2.904E-02	9.450E-05	1.041E 03	9.492E 04	3.867E 03
1650	1399	5.936E-19	1.731E-08	471.2	3.99	1.372E-02	4.013E-05	6.780E 02	8.522E 04	3.764E 03
1700	1399	5.298E-19	1.558E-08	481.3	3.95	6.541E-03	1.723E-05	4.438E 02	7.662E 04	3.665E 03
1750	1399	4.745E-19	1.406E-08	490.9	3.92	3.147E-03	7.471E-06	2.921E 02	6.898E 04	3.570E 03
1800	1399	4.263E-19	1.271E-08	500.1	3.90	1.528E-03	3.274E-06	1.932E 02	6.218E 04	3.479E 03
1850	1399	3.839E-19	1.151E-08	509.0	3.88	7.483E-04	1.449E-06	1.284E 02	5.612E 04	3.391E 03
1900	1399	3.465E-19	1.044E-08	517.9	3.86	3.697E-04	6.476E-07	8.579E 01	5.071E 04	3.306E 03
1950	1399	3.134E-19	9.488E-09	526.7	3.84	1.842E-04	2.923E-07	5.759E 01	4.588E 04	3.224E 03
2000	1399	2.839E-19	8.636E-09	535.5	3.82	9.253E-05	1.332E-07	3.885E 01	4.156E 04	3.145E 03
2050	1399	2.576E-19	7.872E-09	544.4	3.81	4.687E-05	6.124E-08	2.632E 01	3.769E 04	3.070E 03

TIME (IN HOURS)= 21.000, COS(TH)= 7.0711E-01, INT GRAD= 1.7162E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	515	1.171E-11	1.860E-02	16.9	26.98	1.915E 11	3.569E 10	3.438E 10	1.550E 07	2.923E 04
140	654	5.407E-12	1.106E-02	21.8	26.56	8.765E 10	1.512E 10	1.985E 10	1.130E 07	2.259E 04
150	771	2.976E-12	7.290E-03	26.2	26.17	4.770E 10	7.728E 09	1.306E 10	8.986E 06	1.885E 04
160	869	1.824E-12	5.106E-03	30.0	25.80	2.885E 10	4.426E 09	9.310E 09	7.550E 06	1.651E 04
170	949	1.201E-12	3.723E-03	33.3	25.44	1.870E 10	2.732E 09	6.996E 09	6.578E 06	1.493E 04
180	1014	8.309E-13	2.793E-03	36.2	25.09	1.272E 10	1.776E 09	5.454E 09	5.877E 06	1.380E 04
190	1068	5.961E-13	2.140E-03	38.8	24.73	8.954E 09	1.198E 09	4.365E 09	5.348E 06	1.297E 04
200	1112	4.396E-13	1.666E-03	41.1	24.38	6.466E 09	8.310E 08	3.561E 09	4.931E 06	1.233E 04
220	1177	2.536E-13	1.048E-03	45.1	23.67	3.558E 09	4.235E 08	2.469E 09	4.310E 06	1.142E 04
240	1221	1.548E-13	6.839E-04	48.5	22.97	2.053E 09	2.272E 08	1.775E 09	3.859E 06	1.081E 04
260	1251	9.825E-14	4.586E-04	51.6	22.28	1.222E 09	1.260E 08	1.305E 09	3.507E 06	1.036E 04
280	1272	6.425E-14	3.144E-04	54.4	21.61	7.422E 08	7.150E 07	9.744E 08	3.219E 06	1.002E 04
300	1287	4.304E-14	2.196E-04	57.0	20.96	4.575E 08	4.122E 07	7.352E 08	2.974E 06	9.739E 03
320	1297	2.942E-14	1.558E-04	59.6	20.35	2.850E 08	2.404E 07	5.590E 08	2.759E 06	9.501E 03
340	1304	2.046E-14	1.122E-04	62.0	19.78	1.790E 08	1.415E 07	4.274E 08	2.568E 06	9.293E 03
360	1310	1.446E-14	8.174E-05	64.4	19.26	1.132E 08	8.386E 06	3.282E 08	2.396E 06	9.104E 03
380	1314	1.036E-14	6.022E-05	66.6	18.78	7.196E 07	5.001E 06	2.529E 08	2.239E 06	8.931E 03
400	1317	7.511E-15	4.481E-05	68.7	18.35	4.596E 07	2.998E 06	1.955E 08	2.095E 06	8.769E 03
420	1319	5.510E-15	3.364E-05	70.7	17.97	2.947E 07	1.806E 06	1.515E 08	1.963E 06	8.615E 03
440	1321	4.083E-15	2.545E-05	72.6	17.62	1.897E 07	1.092E 06	1.177E 08	1.840E 06	8.469E 03
460	1322	3.053E-15	1.939E-05	74.5	17.31	1.225E 07	6.628E 05	9.161E 07	1.727E 06	8.328E 03
480	1324	2.302E-15	1.487E-05	76.2	17.03	7.936E 06	4.038E 05	7.144E 07	1.621E 06	8.193E 03
500	1324	1.748E-15	1.147E-05	77.8	16.78	5.157E 06	2.468E 05	5.581E 07	1.523E 06	8.062E 03
520	1325	1.336E-15	8.892E-06	79.4	16.55	3.361E 06	1.514E 05	4.367E 07	1.431E 06	7.934E 03
540	1326	1.027E-15	6.930E-06	81.0	16.33	2.196E 06	9.314E 04	3.423E 07	1.346E 06	7.811E 03
560	1326	7.934E-16	5.426E-06	82.5	16.12	1.439E 06	5.748E 04	2.688E 07	1.266E 06	7.690E 03
580	1327	6.160E-16	4.268E-06	84.1	15.92	9.456E 05	3.558E 04	2.113E 07	1.192E 06	7.572E 03
600	1327	4.803E-16	3.373E-06	85.7	15.71	6.229E 05	2.209E 04	1.664E 07	1.122E 06	7.457E 03
620	1327	3.760E-16	2.677E-06	87.4	15.50	4.113E 05	1.375E 04	1.312E 07	1.057E 06	7.345E 03
640	1328	2.955E-16	2.134E-06	89.2	15.28	2.723E 05	8.589E 03	1.036E 07	9.959E 05	7.236E 03
660	1328	2.330E-16	1.710E-06	91.1	15.05	1.807E 05	5.378E 03	8.197E 06	9.388E 05	7.129E 03
680	1328	1.844E-16	1.376E-06	93.2	14.80	1.202E 05	3.377E 03	6.492E 06	8.853E 05	7.024E 03
700	1328	1.464E-16	1.113E-06	95.5	14.52	8.018E 04	2.126E 03	5.149E 06	8.351E 05	6.921E 03
720	1329	1.166E-16	9.055E-07	98.1	14.22	5.360E 04	1.342E 03	4.089E 06	7.881E 05	6.821E 03

740	1329	9.318E-17	7.407E-07	101.0	13.90	3.591E 04	8.496E 02	3.251E 06	7.439E 05	6.723E 03
760	1329	7.472E-17	6.094E-07	104.2	13.55	2.412E 04	5.392E 02	2.589E 06	7.025E 05	6.627E 03
780	1329	6.013E-17	5.046E-07	107.8	13.17	1.623E 04	3.431E 02	2.064E 06	6.636E 05	6.533E 03
800	1329	4.856E-17	4.206E-07	111.9	12.76	1.095E 04	2.189E 02	1.648E 06	6.271E 05	6.440E 03
820	1329	3.937E-17	3.530E-07	116.5	12.33	7.404E 03	1.400E 02	1.317E 06	5.928E 05	6.350E 03
840	1329	3.204E-17	2.984E-07	121.7	11.87	5.017E 03	8.977E 01	1.054E 06	5.605E 05	6.261E 03
860	1329	2.619E-17	2.541E-07	127.4	11.39	3.407E 03	5.770E 01	8.450E 05	5.302E 05	6.175E 03
880	1330	2.151E-17	2.180E-07	133.9	10.91	2.319E 03	3.718E 01	6.780E 05	5.016E 05	6.090E 03
900	1330	1.775E-17	1.885E-07	141.1	10.41	1.581E 03	2.402E 01	5.447E 05	4.748E 05	6.006E 03
920	1330	1.472E-17	1.642E-07	149.0	9.91	1.081E 03	1.555E 01	4.381E 05	4.495E 05	5.925E 03
940	1330	1.227E-17	1.441E-07	157.6	9.42	7.402E 02	1.010E 01	3.528E 05	4.257E 05	5.844E 03
960	1330	1.030E-17	1.274E-07	167.0	8.94	5.080E 02	6.569E 00	2.845E 05	4.033E 05	5.766E 03
980	1330	8.688E-18	1.134E-07	177.2	8.47	3.494E 02	4.284E 00	2.297E 05	3.822E 05	5.689E 03
1000	1330	7.378E-18	1.016E-07	188.0	8.03	2.408E 02	2.800E 00	1.856E 05	3.623E 05	5.613E 03
1050	1330	5.047E-18	7.935E-08	217.5	7.03	9.577E 01	9.771E-01	1.095E 05	3.173E 05	5.430E 03
1100	1330	3.602E-18	6.402E-08	249.2	6.22	3.857E 01	3.458E-01	6.510E 04	2.785E 05	5.256E 03
1150	1330	2.681E-18	5.300E-08	281.0	5.59	1.572E 01	1.241E-01	3.896E 04	2.448E 05	5.089E 03
1200	1330	2.073E-18	4.476E-08	311.0	5.12	6.483E 00	4.513E-02	2.347E 04	2.155E 05	4.930E 03
1250	1330	1.657E-18	3.837E-08	338.0	4.77	2.705E 00	1.664E-02	1.424E 04	1.901E 05	4.778E 03
1300	1330	1.361E-18	3.326E-08	361.4	4.52	1.142E 00	6.212E-03	8.691E 03	1.679E 05	4.632E 03
1350	1330	1.142E-18	2.907E-08	381.2	4.34	4.872E-01	2.349E-03	5.340E 03	1.486E 05	4.492E 03
1400	1330	9.749E-19	2.557E-08	398.0	4.21	2.102E-01	8.997E-04	3.302E 03	1.317E 05	4.359E 03
1450	1330	8.427E-19	2.261E-08	412.3	4.12	9.169E-02	3.488E-04	2.054E 03	1.169E 05	4.231E 03
1500	1330	7.353E-19	2.006E-08	424.6	4.05	4.042E-02	1.369E-04	1.285E 03	1.039E 05	4.108E 03
1550	1330	6.463E-19	1.786E-08	435.6	4.00	1.800E-02	5.434E-05	8.093E 02	9.253E 04	3.990E 03
1600	1330	5.712E-19	1.594E-08	445.6	3.96	8.098E-03	2.183E-05	5.125E 02	8.250E 04	3.878E 03
1650	1330	5.070E-19	1.427E-08	454.9	3.93	3.680E-03	8.868E-06	3.264E 02	7.366E 04	3.769E 03
1700	1330	4.516E-19	1.280E-08	463.7	3.90	1.688E-03	3.643E-06	2.090E 02	6.586E 04	3.665E 03
1750	1330	4.034E-19	1.150E-08	472.3	3.88	7.822E-04	1.513E-06	1.346E 02	5.897E 04	3.565E 03
1800	1330	3.613E-19	1.035E-08	480.7	3.86	3.658E-04	6.353E-07	8.714E 01	5.287E 04	3.469E 03
1850	1330	3.242E-19	9.340E-09	489.2	3.84	1.727E-04	2.695E-07	5.672E 01	4.746E 04	3.377E 03
1900	1330	2.915E-19	8.440E-09	497.6	3.82	8.224E-05	1.156E-07	3.711E 01	4.267E 04	3.288E 03
1950	1330	2.625E-19	7.639E-09	506.2	3.80	3.952E-05	5.005E-08	2.440E 01	3.840E 04	3.203E 03
2000	1330	2.368E-19	6.927E-09	514.9	3.78	1.916E-05	2.189E-08	1.613E 01	3.461E 04	3.121E 03
2050	1330	2.140E-19	6.291E-09	523.8	3.76	9.370E-06	9.672E-09	1.071E 01	3.123E 04	3.042E 03

TIME (IN HOURS)= 22.000, COS(TH)= 8.6602E-01, INT GRAD= 1.7229E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	515	1.172E-11	1.860E-02	16.9	26.98	1.916E 11	3.571E 10	3.439E 10	1.550E 07	2.924E 04
140	651	5.424E-12	1.106E-02	21.7	26.56	8.792E 10	1.517E 10	1.992E 10	1.134E 07	2.268E 04
150	765	2.991E-12	7.265E-03	26.0	26.17	4.793E 10	7.762E 09	1.315E 10	9.057E 06	1.901E 04
160	858	1.834E-12	5.070E-03	29.6	25.80	2.900E 10	4.444E 09	9.389E 09	7.638E 06	1.671E 04
170	933	1.206E-12	3.680E-03	32.8	25.43	1.877E 10	2.738E 09	7.062E 09	6.676E 06	1.517E 04
180	994	8.330E-13	2.747E-03	35.6	25.06	1.274E 10	1.774E 09	5.505E 09	5.981E 06	1.407E 04
190	1043	5.959E-13	2.093E-03	38.0	24.70	8.934E 09	1.191E 09	4.402E 09	5.453E 06	1.326E 04
200	1083	4.377E-13	1.620E-03	40.2	24.34	6.423E 09	8.217E 08	3.587E 09	5.035E 06	1.264E 04
220	1143	2.503E-13	1.007E-03	43.9	23.61	3.495E 09	4.131E 08	2.475E 09	4.409E 06	1.175E 04
240	1182	1.512E-13	6.492E-04	47.2	22.88	1.990E 09	2.182E 08	1.768E 09	3.949E 06	1.114E 04
260	1209	9.492E-14	4.303E-04	50.1	22.17	1.167E 09	1.190E 08	1.290E 09	3.589E 06	1.070E 04
280	1227	6.139E-14	2.917E-04	52.8	21.47	6.977E 08	6.629E 07	9.552E 08	3.290E 06	1.035E 04
300	1240	4.068E-14	2.015E-04	55.4	20.81	4.230E 08	3.749E 07	7.143E 08	3.035E 06	1.007E 04
320	1249	2.752E-14	1.415E-04	57.9	20.18	2.591E 08	2.145E 07	5.380E 08	2.811E 06	9.821E 03
340	1255	1.895E-14	1.009E-04	60.2	19.61	1.600E 08	1.237E 07	4.074E 08	2.612E 06	9.605E 03
360	1260	1.326E-14	7.282E-05	62.5	19.08	9.941E 07	7.190E 06	3.098E 08	2.432E 06	9.408E 03
380	1263	9.414E-15	5.317E-05	64.7	18.60	6.209E 07	4.203E 06	2.364E 08	2.267E 06	9.227E 03
400	1266	6.770E-15	3.921E-05	66.7	18.17	3.896E 07	2.469E 06	1.809E 08	2.117E 06	9.056E 03
420	1268	4.925E-15	2.918E-05	68.7	17.79	2.455E 07	1.457E 06	1.388E 08	1.978E 06	8.894E 03
440	1269	3.619E-15	2.189E-05	70.5	17.45	1.552E 07	8.634E 05	1.067E 08	1.850E 06	8.739E 03
460	1270	2.685E-15	1.654E-05	72.2	17.14	9.848E 06	5.136E 05	8.225E 07	1.732E 06	8.589E 03
480	1271	2.008E-15	1.258E-05	73.9	16.87	6.268E 06	3.067E 05	6.350E 07	1.622E 06	8.445E 03
500	1272	1.512E-15	9.625E-06	75.5	16.62	4.002E 06	1.837E 05	4.911E 07	1.520E 06	8.305E 03
520	1273	1.147E-15	7.404E-06	77.0	16.39	2.563E 06	1.104E 05	3.805E 07	1.425E 06	8.170E 03
540	1273	8.745E-16	5.726E-06	78.6	16.17	1.646E 06	6.661E 04	2.953E 07	1.337E 06	8.037E 03
560	1274	6.704E-16	4.450E-06	80.1	15.95	1.060E 06	4.030E 04	2.295E 07	1.255E 06	7.909E 03
580	1274	5.164E-16	3.475E-06	81.7	15.74	6.843E 05	2.446E 04	1.787E 07	1.178E 06	7.783E 03
600	1274	3.995E-16	2.727E-06	83.3	15.52	4.431E 05	1.489E 04	1.393E 07	1.106E 06	7.661E 03
620	1275	3.103E-16	2.151E-06	85.1	15.29	2.876E 05	9.089E 03	1.088E 07	1.039E 06	7.541E 03
640	1275	2.419E-16	1.705E-06	87.0	15.04	1.872E 05	5.566E 03	8.511E 06	9.771E 05	7.424E 03
660	1275	1.893E-16	1.358E-06	89.1	14.78	1.221E 05	3.418E 03	6.666E 06	9.188E 05	7.310E 03
680	1275	1.487E-16	1.088E-06	91.4	14.49	7.990E 04	2.105E 03	5.229E 06	8.644E 05	7.198E 03
700	1276	1.172E-16	8.769E-07	94.0	14.18	5.240E 04	1.300E 03	4.107E 06	8.134E 05	7.088E 03
720	1276	9.271E-17	7.111E-07	96.9	13.83	3.445E 04	8.055E 02	3.231E 06	7.658E 05	6.982E 03

740	1276	7.361E-17	5.804E-07	100.2	13.45	2.270E 04	5.003E 02	2.545E 06	7.211E 05	6.877E 03
760	1276	5.866E-17	4.771E-07	103.9	13.05	1.499E 04	3.116E 02	2.007E 06	6.794E 05	6.775E 03
780	1276	4.694E-17	3.950E-07	108.1	12.61	9.929E 03	1.946E 02	1.586E 06	6.403E 05	6.674E 03
800	1276	3.772E-17	3.296E-07	112.9	12.14	6.590E 03	1.219E 02	1.254E 06	6.036E 05	6.576E 03
820	1276	3.044E-17	2.772E-07	118.3	11.66	4.384E 03	7.651E 01	9.933E 05	5.692E 05	6.480E 03
840	1277	2.469E-17	2.350E-07	124.4	11.15	2.923E 03	4.817E 01	7.877E 05	5.370E 05	6.386E 03
860	1277	2.013E-17	2.009E-07	131.1	10.63	1.953E 03	3.040E 01	6.255E 05	5.068E 05	6.294E 03
880	1277	1.650E-17	1.732E-07	138.7	10.11	1.308E 03	1.924E 01	4.973E 05	4.784E 05	6.204E 03
900	1277	1.360E-17	1.506E-07	147.1	9.59	8.783E 02	1.220E 01	3.959E 05	4.518E 05	6.116E 03
920	1277	1.128E-17	1.320E-07	156.2	9.08	5.909E 02	7.761E 00	3.156E 05	4.268E 05	6.029E 03
940	1277	9.423E-18	1.166E-07	166.1	8.58	3.984E 02	4.948E 00	2.519E 05	4.033E 05	5.944E 03
960	1277	7.923E-18	1.037E-07	176.7	8.11	2.692E 02	3.162E 00	2.013E 05	3.812E 05	5.861E 03
980	1277	6.710E-18	9.293E-08	188.0	7.66	1.823E 02	2.026E 00	1.611E 05	3.604E 05	5.779E 03
1000	1277	5.724E-18	8.382E-08	199.9	7.25	1.237E 02	1.301E 00	1.290E 05	3.409E 05	5.699E 03
1050	1277	3.977E-18	6.643E-08	231.1	6.36	4.736E 01	4.347E-01	7.450E 04	2.970E 05	5.506E 03
1100	1277	2.894E-18	5.424E-08	262.9	5.66	1.837E 01	1.474E-01	4.333E 04	2.592E 05	5.322E 03
1150	1277	2.198E-18	4.531E-08	293.0	5.15	7.212E 00	5.068E-02	2.539E 04	2.266E 05	5.146E 03
1200	1277	1.733E-18	3.849E-08	319.9	4.78	2.868E 00	1.768E-02	1.498E 04	1.985E 05	4.979E 03
1250	1277	1.408E-18	3.310E-08	343.0	4.52	1.154E 00	6.252E-03	8.898E 03	1.742E 05	4.818E 03
1300	1277	1.172E-18	2.873E-08	362.5	4.33	4.699E-01	2.241E-03	5.322E 03	1.531E 05	4.666E 03
1350	1277	9.930E-19	2.511E-08	378.7	4.20	1.936E-01	8.141E-04	3.205E 03	1.348E 05	4.519E 03
1400	1277	8.528E-19	2.205E-08	392.3	4.11	8.068E-02	2.996E-04	1.942E 03	1.188E 05	4.379E 03
1450	1277	7.398E-19	1.945E-08	404.1	4.04	3.400E-02	1.117E-04	1.185E 03	1.050E 05	4.246E 03
1500	1277	6.465E-19	1.722E-08	414.5	3.99	1.449E-02	4.216E-05	7.273E 02	9.286E 04	4.117E 03
1550	1277	5.682E-19	1.528E-08	423.9	3.95	6.238E-03	1.611E-05	4.492E 02	8.227E 04	3.995E 03
1600	1277	5.016E-19	1.360E-08	432.7	3.92	2.715E-03	6.232E-06	2.791E 02	7.301E 04	3.877E 03
1650	1277	4.443E-19	1.213E-08	441.1	3.89	1.194E-03	2.439E-06	1.745E 02	6.488E 04	3.764E 03
1700	1277	3.947E-19	1.084E-08	449.3	3.87	5.306E-04	9.657E-07	1.097E 02	5.774E 04	3.656E 03
1750	1277	3.516E-19	9.706E-09	457.5	3.85	2.381E-04	3.868E-07	6.935E 01	5.146E 04	3.553E 03
1800	1277	3.138E-19	8.710E-09	465.6	3.82	1.079E-04	1.567E-07	4.410E 01	4.593E 04	3.453E 03
1850	1277	2.806E-19	7.830E-09	473.8	3.80	4.937E-05	6.415E-08	2.820E 01	4.105E 04	3.357E 03
1900	1277	2.514E-19	7.053E-09	482.2	3.78	2.280E-05	2.655E-08	1.813E 01	3.674E 04	3.266E 03
1950	1277	2.256E-19	6.364E-09	490.8	3.76	1.063E-05	1.111E-08	1.171E 01	3.293E 04	3.177E 03
2000	1277	2.027E-19	5.752E-09	499.5	3.74	5.002E-06	4.696E-09	7.610E 00	2.955E 04	3.092E 03
2050	1277	1.825E-19	5.209E-09	508.5	3.72	2.374E-06	2.005E-09	4.969E 00	2.655E 04	3.011E 03

TIME (IN HOURS)= 23.000, COS(TH)= 9.6593E-01, INT GRAD= 1.7265E 01

ALT KM	TEMP K	DENSITY GM/CM3	PRESSURE DYNE/CM2	SCALE HT KM	MEAN MOL WT	N(N2) /CM3	N(O2) /CM3	N(O) /CM3	N(HE) /CM3	N(H) /CM3
120	355	3.536E-11	3.802E-02	11.4	27.46	5.800E 11	1.200E 11	7.600E 10	2.500E 07	4.356E 04
130	515	1.173E-11	1.860E-02	16.8	26.98	1.917E 11	3.574E 10	3.442E 10	1.552E 07	2.927E 04
140	648	5.441E-12	1.104E-02	21.6	26.56	8.820E 10	1.521E 10	2.000E 10	1.139E 07	2.278E 04
150	758	3.004E-12	7.236E-03	25.7	26.17	4.814E 10	7.791E 09	1.323E 10	9.131E 06	1.917E 04
160	847	1.842E-12	5.030E-03	29.3	25.79	2.912E 10	4.457E 09	9.462E 09	7.726E 06	1.692E 04
170	918	1.210E-12	3.635E-03	32.3	25.41	1.882E 10	2.739E 09	7.121E 09	6.771E 06	1.541E 04
180	976	8.335E-13	2.700E-03	34.9	25.04	1.273E 10	1.768E 09	5.548E 09	6.078E 06	1.433E 04
190	1022	5.943E-13	2.046E-03	37.2	24.67	8.895E 09	1.182E 09	4.431E 09	5.549E 06	1.353E 04
200	1059	4.349E-13	1.576E-03	39.3	24.30	6.365E 09	8.106E 08	3.603E 09	5.129E 06	1.292E 04
220	1113	2.465E-13	9.690E-04	42.9	23.55	3.425E 09	4.023E 08	2.474E 09	4.494E 06	1.205E 04
240	1150	1.474E-13	6.181E-04	46.0	22.80	1.926E 09	2.095E 08	1.756E 09	4.025E 06	1.143E 04
260	1174	9.166E-14	4.056E-04	48.9	22.06	1.114E 09	1.125E 08	1.272E 09	3.654E 06	1.098E 04
280	1191	5.872E-14	2.724E-04	51.6	21.35	6.571E 08	6.165E 07	9.348E 08	3.346E 06	1.063E 04
300	1203	3.855E-14	1.865E-04	54.1	20.67	3.928E 08	3.430E 07	6.935E 08	3.082E 06	1.034E 04
320	1211	2.585E-14	1.299E-04	56.5	20.04	2.371E 08	1.929E 07	5.181E 08	2.850E 06	1.008E 04
340	1217	1.766E-14	9.185E-05	58.9	19.45	1.443E 08	1.095E 07	3.891E 08	2.643E 06	9.860E 03
360	1221	1.226E-14	6.580E-05	61.1	18.92	8.833E 07	6.255E 06	2.935E 08	2.456E 06	9.655E 03
380	1224	8.642E-15	4.769E-05	63.2	18.44	5.437E 07	3.595E 06	2.221E 08	2.285E 06	9.466E 03
400	1226	6.171E-15	3.493E-05	65.2	18.02	3.362E 07	2.077E 06	1.686E 08	2.129E 06	9.287E 03
420	1228	4.459E-15	2.581E-05	67.1	17.64	2.087E 07	1.205E 06	1.282E 08	1.986E 06	9.117E 03
440	1229	3.256E-15	1.923E-05	68.9	17.30	1.300E 07	7.022E 05	9.779E 07	1.854E 06	8.954E 03
460	1230	2.399E-15	1.443E-05	70.5	17.00	8.131E 06	4.108E 05	7.473E 07	1.732E 06	8.797E 03
480	1231	1.783E-15	1.091E-05	72.1	16.73	5.100E 06	2.412E 05	5.722E 07	1.618E 06	8.645E 03
500	1232	1.334E-15	8.290E-06	73.7	16.49	3.209E 06	1.421E 05	4.389E 07	1.514E 06	8.498E 03
520	1232	1.005E-15	6.337E-06	75.2	16.25	2.026E 06	8.405E 04	3.372E 07	1.416E 06	8.355E 03
540	1233	7.616E-16	4.870E-06	76.7	16.03	1.282E 06	4.986E 04	2.596E 07	1.326E 06	8.216E 03
560	1233	5.800E-16	3.762E-06	78.3	15.81	8.140E 05	2.968E 04	2.001E 07	1.242E 06	8.081E 03
580	1234	4.439E-16	2.922E-06	79.9	15.58	5.182E 05	1.772E 04	1.545E 07	1.163E 06	7.949E 03
600	1234	3.412E-16	2.281E-06	81.6	15.35	3.308E 05	1.061E 04	1.195E 07	1.090E 06	7.820E 03
620	1234	2.633E-16	1.790E-06	83.5	15.10	2.117E 05	6.376E 03	9.259E 06	1.023E 06	7.694E 03
640	1235	2.040E-16	1.412E-06	85.5	14.83	1.359E 05	3.842E 03	7.184E 06	9.593E 05	7.571E 03
660	1235	1.587E-16	1.121E-06	87.7	14.53	8.742E 04	2.322E 03	5.582E 06	9.003E 05	7.451E 03
680	1235	1.239E-16	8.954E-07	90.3	14.21	5.640E 04	1.408E 03	4.344E 06	8.452E 05	7.333E 03
700	1235	9.710E-17	7.199E-07	93.1	13.85	3.648E 04	8.560E 02	3.385E 06	7.938E 05	7.218E 03
720	1235	7.639E-17	5.828E-07	96.4	13.46	2.365E 04	5.219E 02	2.642E 06	7.458E 05	7.106E 03

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